



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE

Office of National Marine Sanctuaries
1305 East-West Highway
Silver Spring, Maryland 20910

20 FEB 2009

Mr. C. Duane Harris
Chairman
South Atlantic Fishery Management Council
4055 Faber Place Drive, Suite 201
North Charleston, SC 29405

Dear Mr. Harris:

This letter formally provides the South Atlantic Fishery Management Council (SAFMC) with the opportunity to prepare draft sanctuary fishing regulations for a proposed research area in the Gray's Reef National Marine Sanctuary (GRNMS or sanctuary). Under Section 304(a)(5) of the National Marine Sanctuaries Act (NMSA, 16 U.S.C. § 1434(a)(5)), regional fishery management councils are provided the opportunity to prepare draft NMSA regulations for fishing within the EEZ to implement the proposed designation. The goals and objectives of Sanctuary designation, together with the purposes and policies of the NMSA, serve as the benchmarks against which a regional fishery management council's draft regulations, or determinations that regulations are not necessary, are measured. The SAFMC has considerable expertise in developing fishing regulations, and could provide valuable assistance to NOAA in developing draft NMSA regulations for fishing in GRNMS.

Actions under Consideration and Request

NOAA's Office of National Marine Sanctuaries (ONMS) is providing the SAFMC the opportunity to draft proposed regulations for fishing within a research area that is being proposed by ONMS in GRNMS. The purpose of the proposed research area would be to increase the opportunity to discriminate scientifically between natural and human-induced changes to species populations in the sanctuary.

Although allowable fishing gear has been regulated in the sanctuary since its designation in 1981, recreational fishing has always been allowed, and continues to have an impact on the living marine resources and habitats of GRNMS. Because recreational fishing is allowed throughout the sanctuary, NOAA has limited options through which to gain better management information on the effects of fishing and other human impacts on sanctuary resources. A research area would allow investigations to evaluate possible impacts from recreational fishing – particularly bottom fishing – on the sanctuary's natural resources. The ability to conduct these investigations in a marine environment where human influences can be minimized is critical to understanding how these systems function.

As described and explained in the enclosed document, NOAA believes the best option to meeting its need is to prohibit all fishing in, and stopping while transiting through, the research area. Throughout the process to examine the concept of a research area there has been strong support that

bottom fishing for reef-related fish species should be prohibited in a research area in order to conduct the needed studies. NOAA had initially considered allowing fishing (trolling) in the research area for coastal pelagic fish species such as king mackerel; however, increasing evidence of the linkages between benthic and pelagic communities in the marine environment, and the complications for law enforcement appears to support the conclusion that trolling for pelagic species could severely compromise the integrity of the research area. Therefore, prohibiting all fishing in the research area is the preferred alternative to meet the purpose and need of a research area.

NOAA believes it would be a hardship for many boaters if transiting through the area were prohibited. Therefore, boaters would be allowed to transit through the research area without stopping, with an exemption for law enforcement or emergency purposes. Because it is difficult to determine from a distance what a stopped boater may be doing, and because a violator may hide evidence as law enforcement officers approach, the burden of proving a violation would be significant. Given the potential hardship to boaters if transit were prohibited through a research area, and the law enforcement complications if stopping were allowed, transit with no interruption is NOAA's preferred option. Other alternatives that are analyzed, including the "no action" alternative, are discussed in the accompanying document.

NOAA is currently evaluating several potential boundary options that were recommended by the multi-stakeholder working group (the "Research Area Working Group" or RAWG). These alternatives are described and evaluated in the enclosed document. NOAA has determined the Southern Option Boundary (Figure 1) would meet the purpose and need of a research area. Of the boundary options considered, this boundary is favored by law enforcement officials, some scientists, and users who commented on boundary alternatives during scoping. The Sanctuary Advisory Council recommendations to NOAA include the Southern Option Boundary as the preferred boundary alternative. Three sides of the Southern Option Boundary are existing boundaries of the sanctuary, which is expected to minimize user conflicts and make compliance simpler. The location, which is somewhat distant from the heavily-used north-central area of concentrated ledge, also eases the burden of compliance and enforcement while minimizing user displacement. Given the small economic impacts anticipated if the Southern Option Boundary is designated as a research area and the minimal user displacement, negative economic consequences would be low with this action.

The primary site selection criterion for a research area was an area that included bottom features representative of the sanctuary as a whole. The selection criterion – an occurrence of approximately 20 percent of GRNMS ledges (including small, medium and tall) – is met in the preferred boundary option. Sufficient amounts of the other three habitat types are also included in the Southern Option Boundary. Outside of the Southern Option Boundary there would be more than adequate (approximate 80 per cent) ledge and other habitat types for necessary comparisons and for other allowed activities. In fact, the areas outside of the Southern Option Boundary appear to be the preferred fishing and diving locations for users. Therefore, the primary goals of research and protection within this area would mesh well with user demand and ease of understanding and enforcing the preferred boundary, creating a research area.

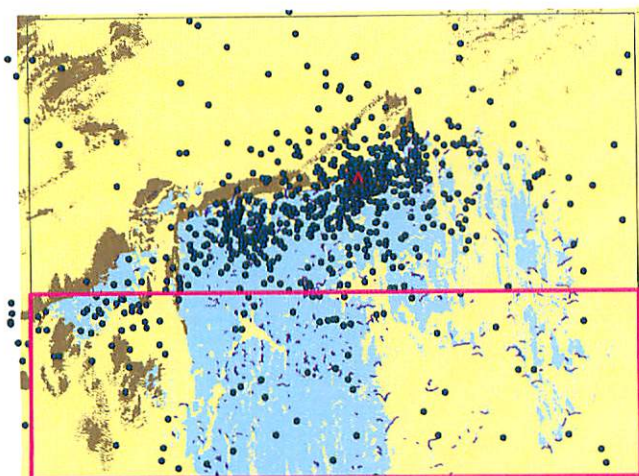


Figure 1. Southern Option Boundary (Preferred Alternative). Dots indicate boat locations.

Legal Authority

Section 304(a)(5) of the NMSA requires that:

The Secretary shall provide the appropriate Regional Fishery Management Council with the opportunity to prepare draft regulations for fishing within the Exclusive Economic Zone as the Council may deem necessary to implement the proposed designation. Draft regulations prepared by the Council, or a Council determination that regulations are not necessary pursuant to this paragraph, shall be accepted and issued as proposed regulations by the Secretary unless the Secretary finds that the Council's action fails to fulfill the purposes and policies of this title and the goals and objectives of the proposed designation. In preparing the draft regulations, a Regional Fishery Management Council shall use as guidance the national standards of section 301(a) of the Magnuson-Stevens Act (16 U.S.C. 1851) to the extent that the standards are consistent and compatible with the goals and objectives of the proposed designation. The Secretary shall prepare the fishing regulations, if the Council declines to make a determination with respect to the need for regulations, makes a determination which is rejected by the Secretary, or fails to prepare the draft regulations in a timely manner. Any amendments to the fishing regulations shall be drafted, approved, and issued in the same manner as the original regulations. The Secretary shall also cooperate with other appropriate fishery management authorities with rights or responsibilities within a proposed sanctuary at the earliest practicable stage in drafting any sanctuary fishing regulations.

In preparing draft sanctuary regulations for fishing in GRNMS, the SAFMC would be acting under authority provided by the NMSA and may address all species of fishes and invertebrates. The SAFMC is therefore not restricted to the species or activities regulated under its current fishery management plans, and can address all types of fishing in this limited area.

In addition to the provisions of the NMSA, a Memorandum of Understanding exists between SAFMC, the National Marine Sanctuary Program/GRNMS and NOAA Fisheries Southeast Regional Office, to provide a framework for cooperation and coordination within the SAFMC's

area of geographic authority. The MOU also facilitates the exchange of information, advice and technical assistance, and states specifically that:

Regarding fishing regulation for the Sanctuary, GRNMS is required to follow the provisions of section 304(a)(5) of the NMSA, (16 U.S.C. 1434(a)(5)). The process described in section 304(a)(5) is summarized, in part, here:

1. SAFMC will have the opportunity to draft Sanctuary fishing regulations for GRNMS. Regulations drafted by SAFMC, or a determination by SAFMC that regulations are not necessary, will be accepted and shall be issued as the proposed regulations for GRNMS unless the Secretary of Commerce finds that SAFMC's action does not fulfill the purposes and policies of the NMSA and the objectives of the designation of GRNMS. In that event, the Secretary will draft the fishing regulations.

2. GRNMS will also consult with the State of Georgia regarding fishing regulations proposed by GRNMS for the Sanctuary and shall consider the views and comments of the State of Georgia before issuing final fishing regulations. As part of this process, GRNMS will meet with representatives from the State of Georgia to discuss draft fishing regulations prior to issuance of final fishing regulations. GRNMS will also coordinate with the Georgia Coastal Management Program pursuant to the Federal consistency requirement under § 307 of the Coastal Zone Management Act (16 U.S.C. 1456) and implementing NOAA regulations.

To assist the SAFMC, this letter is accompanied by a document that provides background information, describes more fully the sanctuary's goals and objectives, reviews action alternatives, and presents NOAA's preferred action.

We appreciate the time and effort of the SAFMC in developing proposals for improved conservation and marine resource protection for GRNMS. Please feel free to contact GRNMS Superintendent Dr. George Sedberry (George.Sedberry@noaa.gov; 912/598-2439) or Resource Protection Coordinator Becky Shortland (Becky.Shortland@noaa.gov; 912/598-2381) with questions or for additional information.

Sincerely,

A handwritten signature in black ink, appearing to read "Daniel J. Basta", with a stylized flourish at the end.

Daniel J. Basta
Director

Enclosure:

Gray's Reef National Marine Sanctuary Request for Regulation from the South Atlantic Fishery Management

GRAY'S REEF NATIONAL MARINE SANCTUARY

REQUEST FOR REGULATION FROM THE SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

PROPOSED SANCTUARY RESEARCH AREA

March 2009



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**GRAY’S REEF NATIONAL MARINE SANCTUARY
REQUEST FOR REGULATION
FROM THE
SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL
MARCH 2009**

SUMMARY

Pursuant to section 304(a)(5) of the National Marine Sanctuaries Act (NMSA) (16 U.S.C. § 304(a)(5)), the National Oceanic and Atmospheric Administration’s Office of National Marine Sanctuaries (ONMS) is presenting the South Atlantic Fishery Management Council (SAFMC) the opportunity to prepare draft sanctuary fishing regulations to further the goals and objectives of the Gray’s Reef National Marine Sanctuary (GRNMS or sanctuary). Specifically, ONMS is asking the SAFMC to draft regulations for fishing within a proposed research area established by ONMS within the sanctuary. The purpose of a research area would be to increase the opportunity to discriminate scientifically between natural and human-induced change to species populations in the sanctuary.

Although allowable fishing gear is limited, recreational fishing continues to impact the living marine resources of GRNMS. Because recreational fishing is allowed throughout the sanctuary, NOAA has limited options through which to gain better management information on the effects of fishing and other human impacts, or the effects of natural disturbances, on sanctuary resources. A research area would allow investigations to evaluate possible impacts from recreational fishing – particularly bottom fishing – on the sanctuary’s natural resources. The ability to conduct these investigations in a marine environment where human influences can be minimized is critical to understanding how these systems function.

In general, the purpose of this document is to provide the SAFMC with sufficient information to make an informed decision regarding fishing regulations for the proposed research area. In doing so, this document:

1. provides background information about the sanctuary and the process followed to date to establish a research area;
2. describes a range of alternative management actions to address the need for a research area, including ONMS’s preferred alternative; and
3. provides model regulatory language to facilitate the drafting process for fishing regulations.

This document will also serve as the foundation for a draft environmental impact statement (DEIS) that will analyze the impacts of the management actions in compliance with the National Environmental Policy Act (NEPA). Any proposed regulations issued by NOAA for this action will be released concurrent with a DEIS.

In preparing draft sanctuary regulations for fishing in GRNMS, the SAFMC would be acting under the authority of the NMSA and may address all species of fishes and invertebrates. The SAFMC is therefore not restricted to the species or activities regulated under its current fishery management plans.

BACKGROUND

The sanctuary contains one of the largest nearshore live-bottom reefs in the southeastern United States. The sanctuary protects 22 square miles (57.18 sq km) of open-ocean and submerged lands with patches of productive live-bottom habitat. GRNMS is located 16 miles offshore of Sapelo Island, Ga., on an area of continental shelf stretching from Cape Hatteras, N.C., to Cape Canaveral, Fla., (the South Atlantic Bight) (Figure 1). NOAA designated the area as a national marine sanctuary in 1981.

Within the sanctuary, rock outcroppings stand above the shifting sands. The series of rock ledges and sand expanses has produced a complex habitat of burrows, troughs, and overhangs that provide a solid base for the abundant sessile invertebrates to attach and grow. This topography supports an unusual assemblage of temperate and tropical marine flora and fauna. Algae and invertebrates grow on the exposed rock surfaces. Dominant invertebrates include sponges, barnacles, soft corals, hard coral, sea stars, crabs, lobsters, snails, and shrimp. The reef attracts numerous species of benthic and pelagic fish including black sea bass, red snapper, groupers, and mackerels. Since GRNMS lies in a transition area between temperate and tropical waters, the composition of reef fish populations changes seasonally. Loggerhead sea turtles, a threatened species, use GRNMS year-round for foraging and resting and highly endangered northern right whales are occasionally seen in the sanctuary. The sanctuary is one of the most popular sport fishing areas along the Georgia coast (NMSP 2006, ONMS 2008).

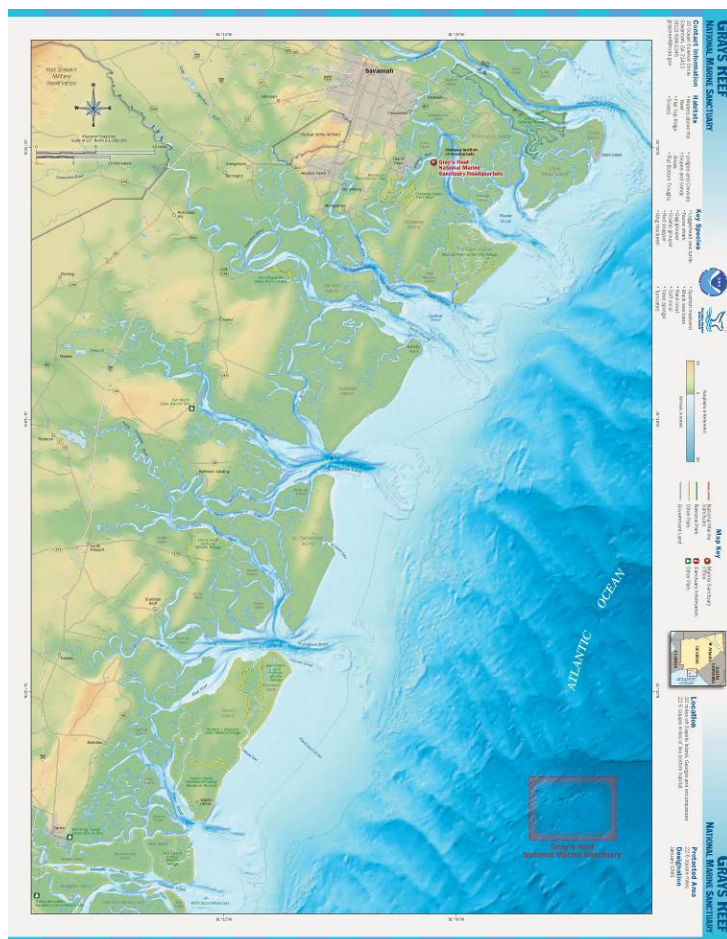


Figure 1. Location of Gray's Reef National Marine Sanctuary

NEED FOR AND PURPOSE OF ACTION

Need for Action

NOAA recently released a report on the condition of GRNMS providing a summary of the status of resources, pressures on those resources, current conditions and trends, and management responses to the pressures that threaten the integrity of the marine environment (ONMS 2008). Specifically, the document includes information on water quality, habitat, living resources, and maritime archaeological resources and the human activities that affect them. Overall, the resources protected by GRNMS appear to be in fair condition (Table 1).

Although allowable fishing gear is limited¹, recreational fishing continues to impact the living marine resources and habitat of the sanctuary. In addition, recreational fishing that occurs throughout the sanctuary but is concentrated in portions of the sanctuary seems to

¹ NOAA's regulations for the sanctuary limit fishing gear in the sanctuary to rod and reel (which is used by the vast majority of users in the sanctuary), handline, and spearfishing without powerheads. 15 CFR § 922.92.

result in marine debris (e.g., monofilament fishing line, sinkers, cans, bottles and rope). Also, some human-produced persistent pollutants and contaminants have reached the sediments and water-filtering organisms of the sanctuary.

Emerging threats to the sanctuary include invasive species, contamination of organisms by waterborne chemicals from human coastal activities, climate change and ever-increasing coastal populations and recreational use of the sanctuary.

Table 1. Gray's Reef NMS Condition Summary Table

Status:

Good	Good/Fair	Fair	Fair/Poor	Poor	Undet.
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Trends: ▲ Conditions appear to be improving.
 — Conditions do not appear to be changing.
 ▼ Conditions appear to be declining.
 ? Undetermined trend.

Questions and Resources	Rating	Basic for Judgment
WATER		
Are specific or multiple stressors, including changing oceanographic and atmospheric conditions, affecting water quality and how are they changing?	?	2000 and 2005 monitoring data suggest good water quality, with some contaminants but below EPA guidelines; insufficient information to assess trend
What is the eutrophic condition of sanctuary waters and how is it changing?	?	Stable nutrients, chlorophyll, lack of harmful algal blooms
Do sanctuary waters pose risks to human health and how are they changing?	—	2000 baseline, 2005 indicators below FDA Levels of Concern
What are the levels of human activities that may influence water quality and how are they changing?	—	Increasing, but little evidence of negative effects
Habitat		
What are the abundance and distribution of major habitat types and how are they changing?	?	Baseline data recently completed; assessment of trends will depend on future observations
What is the condition of biologically structured habitats and how is it changing?	?	Insufficient information on the complex biological structure of habitats to rate condition, though there is evidence of anchor, fishing and storm damage
What are the contaminant concentrations in sanctuary habitats and how are they changing?	—	Low levels in 2000 and 2005
What are the levels of human activities that may influence habitat quality and how are they changing?	?	Localized within areas of heavy use
Living Resources		
What is the status of biodiversity and how is it changing?	?	Considerable benthic, epifauna and fish biodiversity monitoring and data, but insufficient at this time to rate status, trends and impacts as they relate to community development and function
What is the status of environmentally sustainable fishing and how is it changing?	▼	Black sea bass, gag, red grouper, and red snapper regionally overfished and/or undergoing overfishing
What is the status of non-indigenous species and how is it changing?	▼	Two lionfish identified in sanctuary in fall 2007; three titan acorn barnacles found winter 2008
What is the status of key species and how is it changing?	▼	Removal of key fish species and recent sponge mortality
What is the condition or health of key species and how is it changing?	?	Key species tentatively identified but unable to determine condition and health; some contaminants detected in sponges, but cause of mortality undetermined
What are the levels of human activities that may influence living resource quality and how are they changing?	?	Localized within areas of heavy use

Because recreational fishing is allowed throughout the sanctuary, NOAA has limited options for gaining better management information on the effects of fishing on fish and invertebrate populations and their habitats. A research area would allow investigations to evaluate possible impacts from recreational fishing – particularly bottom fishing – on the sanctuary's natural resources. The research area would also allow researchers to

determine the effects of natural events (e.g., hurricanes) and cycles (e.g. droughts) on the sanctuary. Currently the effects of subtle natural variability may be masked by the confounding or even overwhelming effect of fishing. The ability to conduct these investigations in a marine environment free of human influences is critical.

There are currently no natural live-bottom areas in the South Atlantic Bight that have been set aside for scientific use (NMSP 2006). Scientists have suggested that a portion of the 22-square-mile sanctuary delineated as a research area would be very useful to the science community to learn about living resource population changes as a result of fishing compared with similar sites and very well may provide data that is useful in fisheries management throughout the region (Kendall et al. 2008).

Because GRNMS is relatively shallow, it affords the opportunity 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. Scientists agree that without having an area of the naturally occurring live bottom devoted to research, it becomes very difficult to scientifically understand how these reefs function in the life history of many economically valuable species, and what the effects of extractive uses of these habitats are on that productivity (Halpern 2003).

Purpose for Action

National Marine Sanctuaries Act

The purpose for this action is compatible with the purposes and policies of the National Marine Sanctuaries Act. The National Marine Sanctuary System, of which Gray's Reef is a part, is managed pursuant to provisions of the NMSA of 1972, as amended (16 USC §1431 *et seq.*). 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 aesthetic qualities. Sanctuaries are managed to protect and conserve their resources and to allow uses that are compatible with resource protection, the primary goal of the National Marine Sanctuary System. To provide for comprehensive and coordinated conservation and management of natural resources of GRNMS as required by the NMSA, research that includes a control or research area where human impacts are limited is needed. The purposes and policies of the NMSA are included in Appendix A of this document.

Gray's Reef NMS Designation, Goals and Objectives

NOAA designated the sanctuary as this nation's fourth national marine sanctuary in 1981 for the purposes of:

- Protecting the quality of the unique and fragile ecological community;
- Promoting scientific understanding of the live-bottom ecosystem; and
- Enhancing public awareness and wise use of the significant regional resource.

NOAA developed new and expanded goals and objectives that built upon the above purposes and added clarity, specifics and details regarding resource protection, research to enhance understanding, making the public aware of the sanctuary and its resources and promoting compatible use of the sanctuary. These goals were developed in coordination with the GRNMS Sanctuary Advisory Council in 2000 and are included in Appendix B of this document.

THE RESEARCH AREA CONCEPT AND PROCESS

The concept of a research (control) area within the sanctuary has been under discussion for many years. The idea was first raised by members of the public in 1999 during the early stages of the GRNMS Management Plan review process at public scoping meetings. At the time, the GRNMS Sanctuary Advisory Council identified the problem as well—stating that there were no naturally occurring, live-bottom sites within the sanctuary established exclusively for research. The Advisory Council set a target to increase the opportunity to discriminate scientifically between natural and human-induced change to species populations in the sanctuary (NMSP 2006). With release of the 2003 draft GRNMS Management Plan, NOAA formed a broad-based working group of the Advisory Council to consider the concept of a research area within the sanctuary.

The Research Area Working Group (RAWG) consisted of representatives from research, academia, conservation groups, sport fishing and diving interests, education, commercial fishing, law enforcement and state and federal agency representatives. The RAWG met initially in May 2004, and then periodically over the course of a year, to discuss the concept in detail. The RAWG employed a consensus-driven, constituent-based process. All participants discussed the pros and cons, issues, considerations, priorities and concerns at length for each step of the process. A Geographic Information System (GIS) tool was also developed to analyze options (Kendall et al. 2008).

The principle conclusion of the RAWG was that significant research questions exist at GRNMS that can only be addressed by establishing a research area. In June 2005, the Sanctuary Advisory Council met to consider the work of the RAWG. The Advisory Council developed a series of recommendations, based on the RAWG recommendations. They were accepted by NOAA without change. This, along with a commitment to initiate a more formal public review process, was the basis for a goal of the research and monitoring action plan described in the 2006 final GRNMS Management Plan (NMSP 2006).

When the RAWG was reconvened in October 2007, members reassessed allowable fishing activities inside the research area due to new information from a 2005 workshop on benthic and pelagic community linkages and law enforcement concerns. As a result, the final 2008 RAWG and Sanctuary Advisory Council recommendations to GRNMS management included the unanimous recommendation that all fishing be prohibited in the research area.

The 2005 RAWG recommendation to allow pelagic fishing assumed that trolling for coastal pelagic fish species does not involve “bottom-impinging” activities or gear types. However that assumption is not always true. In some cases, sport fishermen utilize methods to fish both coastal pelagic and reef species at the same time (Herum 1999; Bolin 2000). In addition, downriggers and planers, currently permitted in the sanctuary, allow anglers to fish the entire water column, including near the bottom. These gear types can impact benthic communities and allow catch of bottom fish, a primary marine resource to be studied in the research area. When trollers fish downriggers and planers over irregular bottom such as that at GRNMS, the terminal tackle sometimes hits ledges or attached invertebrates, and can cause damage to organisms and habitats, or loss of the tackle and addition to debris on the bottom. Therefore, allowing any fishing including trolling for pelagic fish species could significantly compromise the integrity and effectiveness of a research area.

Through early 2008, the RAWG and Advisory Council continued to evaluate criteria and boundaries utilizing the GIS tool and incorporating new information as it became available. Ultimately, six boundary scenarios and several activity restrictions were selected and became the focus of public scoping during March and April 2008.

After consideration of public comments and deliberations by the RAWG, The sanctuary superintendent received final recommendations from the Advisory Council in August 2008. The alternatives presented in this document are the direct result of the Advisory Council recommendations, and will be the foundation of any NEPA analysis undertaken for this action.

ALTERNATIVES ANALYZED AND ELIMINATED

NOAA is evaluating several alternatives for this proposed action. This document describes the different boundary options NOAA is evaluating along with the different options for addressing human uses. The alternatives include options for:

1. Delineating the boundaries of the research area (“Boundary Alternatives”);
2. Regulating fishing within the research area (“Fishing Alternatives”);
3. Regulating diving within the research area (“Diving Alternatives”); and
4. Regulating vessel operation in the research area (“Vessel Transit Alternatives”).

Each of these categories is described below along with the no-action alternative.

No Action Alternative

Consequences of the No Action Alternative

Under the no action alternative, NOAA would not designate a research area in GRNMS. Current research and monitoring activities would continue as is and extractive use would continue to be allowed throughout the sanctuary.

The expected biological consequences of no action are that there would continue to be no area of the South Atlantic Bight relatively free of human extractive use that could be used to make observations and conduct experiments that will help further our understanding of

live bottom ecosystems and how they function to provide ecological services. Without this research we would not have data needed to assess the impacts of fishing and diving, and would not have data needed to manage the biological resources of GRNMS. In light of changing conditions at GRNMS as a result of invasive species, climate change and other factors, it is important to be able to understand these effects without the confounding effects of fishing and diving.

The importance of shallow complex habitat such as live bottom in the juvenile and young adult stages of many reef fishes is documented (e.g., Gwak 2003; McGovern et al. 2005; Afonso et al. 2007). Because of the large size attained by some of these species, a portion of the population reaches legal catch size before reaching maturity and is retained in the fishery. In addition, there is high release mortality in undersized fish released at the depths found at GRNMS (Rudershausen et al. 2007), so there is some measure of mortality on fishes caught but released in accordance with minimum size and other regulations. The effects of removal of these younger stages on the fishery and the ecology of live bottom reefs are unknown. In spite of years of study, the role of the live bottom ecosystem in fishery production, and the role of healthy fish populations in maintaining stable productive communities in live bottom reefs, is not known, and the heavy fishing pressure exerted throughout the region make well-designed studies difficult. Interest in these studies has increased, especially in relation to development of ecosystem-based fishery management plans. Unfortunately, populations of fishes have already been subject to intense fishing for decades, so it is difficult to determine how habitat and diverse invertebrate and fish assemblages interact with exploited species under natural conditions. There are no inner- or middle-shelf live bottom areas that are not open to fishing.

The SAFMC has recently (February 12, 2009) enacted eight small (27 – 514 square kilometer) no-bottom-fishing MPAs on the outer continental shelf (50 – 300 m depth) from southern North Carolina to the Florida Keys. These small areas are aimed at protecting deepwater reef species and providing areas where natural reef ecosystem can function. Many of the species that will be afforded protection in these deepwater MPAs have juvenile or young adult stages that occur primarily in shallower water, including live bottom areas such as GRNMS, where they are caught as fishery targets or bycatch. In order to help restore populations of these species by protecting younger stages, shallow-water MPAs might be effective; however none exist where the potential of shallow-water MPAs can be studied. In addition, many of the deep MPA sites harbor spawning populations of invasive Pacific lionfish, a problem that does not exist at GRNMS at present, which would make the sanctuary an ideal location for determining natural functions of live bottom reefs in the absence of fishing and invasive lionfish, in depths that can be easily dived and observed.

The socioeconomic impacts of no action could be reduced interest by researchers in conducting research at GRNMS, and the associated expenditures that are included in offshore research projects. Management has estimated that loss to be in the range of \$240K per year.

Conclusions No Action Alternative

No action would result in the status quo for conducting research to fully understand live bottom ecosystems at GRNMS and in the region. A research area that is not impacted by fishing and diving is needed to understand natural variability and other impacts on live bottom systems. This action would not provide that needed control area, therefore this alternative is not preferred.

Boundary Alternatives

The following sections describe the four boundary configurations NOAA is considering. These four options were developed by the Research Area Working Group (RAWG) and the Sanctuary Advisory Council using a geographic information system and public input. The primary site selection criterion for a research area was an area that included bottom features representative of the sanctuary as a whole, with a minimum of 20 per cent ledge habitat (including small, medium and tall ledges). While densely colonized ledge habitat is the highest priority in terms of research interest, sufficient amounts of the other three habitat types (flat sand, rippled sand, and sparsely colonized ledge habitat) are necessary to replicate the sanctuary in a research area. The other important criterion is to minimize the displacement of recreational fishing effort.

1. Southern Option Boundary (preferred)

The Southern Option Boundary (Figure 2) is formed by stretching a line parallel to the southern boundary of the sanctuary and moving it northward from that boundary to a point where the requisite number of ledges – approximately 20 percent, a minimum of 30 short, medium and tall (Kendall² 2008) – are included to accomplish experimental and monitoring goals. Ledge habitat was determined by the RAWG to be the chief criterion for a research area, and this southern area includes at least the minimum number of each ledge height and size category. Specifically, in the Southern Option Boundary there are 30 short, 52 medium and 36 tall ledges as determined by ground-truthed field studies (Kendall² 2008). The area encompasses 8.27 square miles (21.43 square km) extending from the southern boundary of the sanctuary north to 31°23'4"N.

This option also includes only 8.5 per cent of all boat sightings made from 1999-2007, which minimizes impact or displacement of current sanctuary users (primarily rod and reel fishermen). In addition, all bottom types are included in the Southern Option Boundary and sufficient ledge and other bottom types exist outside the area for comparative research and other allowed uses. Although the long-term monitoring site and the data buoy were determined to be desirable inside the boundary of a research area due to the available data sets for both, the RAWG determined that including these features was not crucial for the purposes of the research area. Therefore, they are not included in this boundary alternative (Kendall 2008).

Socioeconomic studies from Georgia coastal counties and sanctuary surveys of visitor use indicate that recreational fishing activities have increased significantly at GRNMS in the past 20 years (Ehler and Leeworthy 2002). The data also indicate that the majority of

² Kendall, M.S. 2008. MPA design using sliding windows: A potential Research Area within Gray's Reef National Marine Sanctuary. NOS Science Seminar, August 2008.

users in the sanctuary are fishing with rod and reel. The trends in use are expected to continue as population increases along the Georgia coast and the popularity of recreational fishing and diving grows. Boat count data acquired from multiple sources from 1999-2007 clearly indicate that most visitors to GRNMS use the north-central portions of the sanctuary where the largest concentration of high-relief ledge habitat is clustered (Figure 2). The Southern Option Boundary was favored by most sanctuary users during the 2008 public scoping for the research area concept because of the minimal impact and ease of compliance and enforcement. Some researchers and other stakeholders commenting on boundary options during scoping also favored the Southern Option Boundary due to the lower potential for interference with other kinds of uses. Some other researchers, however, preferred the Optimal Scientific Option or the Compromise Option boundaries (Figure 3 and 5 below) because of the ability to compare before (heavily fished) and after (no fishing) resource conditions.

The assessment analyzing the potential social and economic impacts of a research area indicated that economic losses with the Southern Option Boundary would be small. Based on the boat counts, approximately 9.2 percent of the overall economic value (\$141,690) of Gray's Reef fishing would be impacted. In terms of statewide saltwater fishing expenditures (Appendix C), that amounts to 0.12 per cent of the total expenditures in Georgia (Ehler 2008). This is considered to be the maximum potential loss as it assumes that fishermen denied access to part of Gray's Reef would not fish anywhere else.

Under this alternative, no boundary markers would be placed around the research area or the sanctuary. Coordinates of the research area in particular, and the sanctuary as a whole, would be included in various outreach materials and posted on the Notice to Mariners and other such outlets frequently visited by users of GRNMS. Although law enforcement officials have recommended marking the boundaries with line-of-sight buoys, scientists are concerned that such an array of buoys would significantly alter the natural systems of the research area. The buoys are certain to attract bait fish and thus artificially attract pelagic species. This in turn is likely to attract more fishermen fishing for bait at the buoys and possibly for pelagic species, which may disturb the natural systems in the slim buffer around core projects. Pelagic fish attracting devices have also been shown to unnaturally alter bottom fish assemblages (Rountree 1990; Kellison and Sedberry 1998) which would compromise the research area.

Conclusions Southern Option Boundary (preferred)

Given the small economic losses anticipated if the Southern Option Boundary is designated as a research area and the minimal user displacement, negative economic consequences are low for the preferred alternative. Of the boundary options considered, this boundary is favored by law enforcement officials, some scientists, and users who commented on a boundary alternative during scoping. The RAWG and Sanctuary Advisory Council recommendations to NOAA include the Southern Option Boundary as the preferred boundary alternative. Three sides of the Southern Option Boundary are existing boundaries of the sanctuary, which is expected to minimize user conflicts and make compliance simpler. The location, which is somewhat distant from the heavily-

used north-central area of concentrated ledge, also eases the burden of compliance and enforcement while minimizing user displacement.

The primary criterion – approximately 20 percent of GRNMS ledges—including small, medium and tall—is met in the preferred boundary option. Sufficient amounts of the other three habitat types are also included in the Southern Option Boundary. Outside of the Southern Option boundary there would be more than adequate (approximate 80 per cent) ledge and other habitat types for necessary comparisons and for other allowed activities. In fact, the areas outside of the Southern Option Boundary appear to be the preferred fishing and diving locations for users.

Therefore, NOAA has determined that the Southern Option Boundary would meet the purpose and need of a research area and is the preferred boundary alternative.

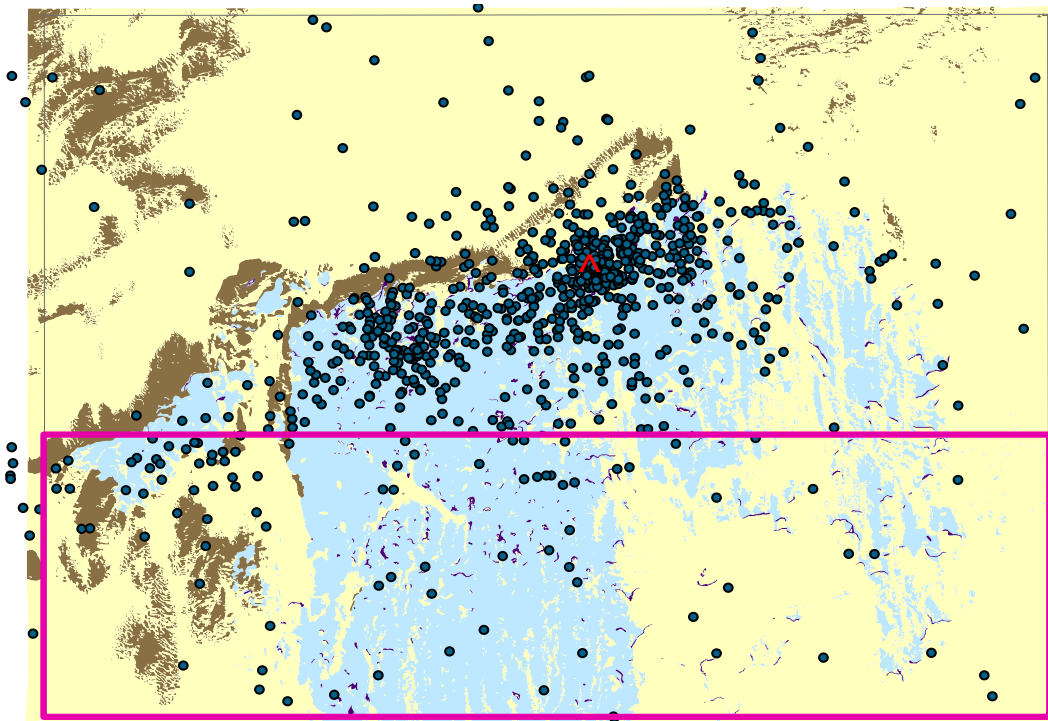


Figure 2. Southern Option Boundary (Preferred Alternative). Dots indicate boat locations.

2. Optimal Scientific Option Boundary

The Optimal Scientific Option Boundary (Figure 3) was selected by the RAWG based solely on research needs. For this scenario, the full size of the research area was selected to be 4 x 4 km for optimal scientific benefits, with 30 of each ledge type (short, medium, and tall) and adequate representative proportions of other bottom types. The resulting characteristics include sufficient ledge and other bottom types outside the boundary for comparative studies and other allowed activities, but this option does encompass approximately 2/3 of all boat sightings indicating that user displacement would be high. The data buoy and long term monitoring site are included in the Optimal Scientific Option Boundary.

While the Optimal Scientific Option Boundary satisfies the primary criterion for ledge and other bottom types, it does not address the recommendation to minimize user displacement and has the highest level of displacement (67 percent) and related socioeconomic impacts of concern to the fishing community. In addition, this boundary option would create open areas on all sides of the boundaries resulting in enforcement and compliance complications. Marking boundaries for the Optional Scientific Option Boundary would require more resources, cost more and maintenance would be more intensive.

Under this alternative, no boundary markers would be placed around the research area or the sanctuary. Coordinates of the research area in particular, and the sanctuary as a whole, would be included in various outreach materials and posted on the Notice to Mariners and other such outlets frequently visited by users of GRNMS.

Conclusions Optimal Scientific Option Boundary

The Optimal Scientific Option Boundary, while meeting the criterion for habitat inside and outside of the boundary scenario, does not meet the recommended minimization of user displacement. This scenario also complicates enforcement and compliance due to the open areas on all sides and it's placement in a well-used area of GRNMS. This option is, therefore, not preferred.

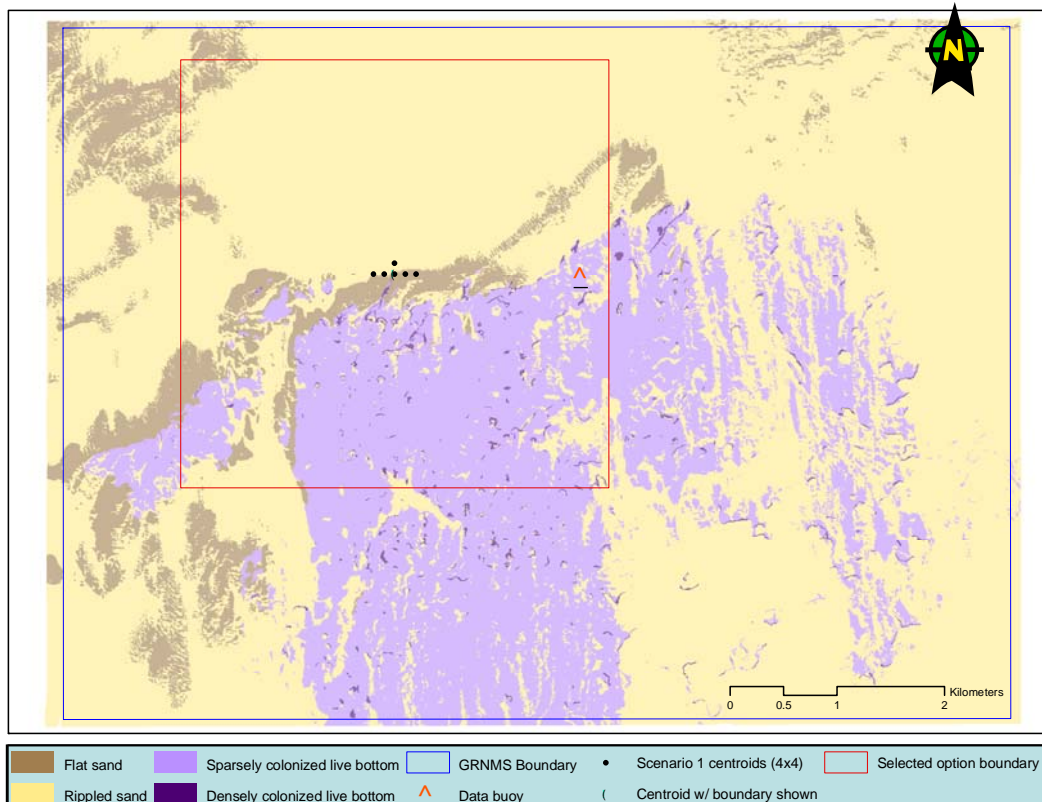


Figure 3. Optimal Scientific Option Boundary.

3. Minimal User Displacement Option Boundary

Selection criteria for the Minimal User Displacement Option Boundary (Figure 4) were based on identifying areas that would have the least impact or displacement of fishermen while meeting the absolute minimal scientific requirements in ledge inclusion. For this scenario, the full size of the research area was selected to be 3 x 3 km and placed where there is a minimum of 30 of each ledge type (short, medium, and tall). The resulting characteristics include sufficient ledge and other bottom types outside the research area available for comparative research and other allowable activities. Minimal User Displacement Option Boundary encompasses approximately 15 per cent of boat sightings. Little if any flat sand, however, is included. The data buoy and long term monitoring site are also not included. The southern boundary of this option could be adjusted to match the existing southern boundary of GRNMS, but open areas to the east and west would result in enforcement and compliance complications, boundary marking costs and more intensive maintenance.

Under this alternative, no boundary markers would be placed around the research area or the sanctuary. Coordinates of the research area in particular, and the sanctuary as a whole, would be included in various outreach materials and posted on the Notice to Mariners and other such outlets frequently visited by users of GRNMS.

Conclusions Minimal User Displacement Option Boundary

Minimal User Displacement Option Boundary while minimizing displacement does include some area preferred by tournament fishermen and the smaller core size of this boundary does not offer adequate research and monitoring opportunity. This boundary option is, therefore, not preferred.

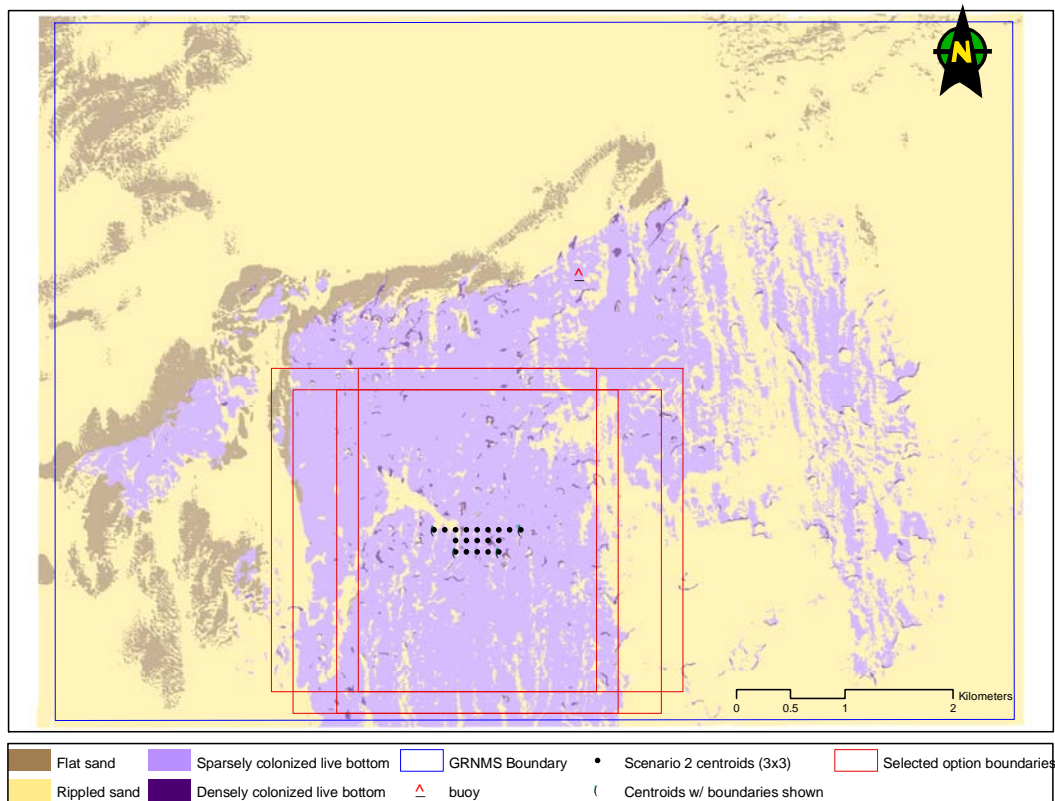


Figure 4. Minimal User Displacement Option Boundary.

4. Compromise Option Boundary

Selection criteria for the Compromise Option Boundary (Figure 5) were based on moderate values for both fishing displacement and scientific needs. The full size of the research area was selected to be 4 x 4 km with the minimum of 30 of each ledge type (small, medium, and tall) and bottom types represented in proportions similar to those of the entire sanctuary. The Compromise Option Boundary encompasses approximately 1/3 of boat sightings. There is sufficient ledge and other bottom types outside the research area available for comparative research and other allowable uses. The boundary does include the long term monitoring site but not the data buoy. The Compromise Option Boundary, as with the Optimal Scientific Option Boundary, would create open areas on all sides of the research area resulting in enforcement and compliance complications, more intensive marking costs, resources and maintenance.

Under this alternative, no boundary markers would be placed around the research area or the sanctuary. Coordinates of the research area in particular, and the sanctuary as a whole, would be included in various outreach materials and posted on the Notice to Mariners and other such outlets frequently visited by users of GRNMS.

Conclusions Compromise Option Boundary

This boundary alternative would create complications with enforcement and compliance. This boundary option also represents the second highest displacement of known users

resulting in socioeconomic impacts of concern to the fishing community. This boundary option is, therefore, not preferred.

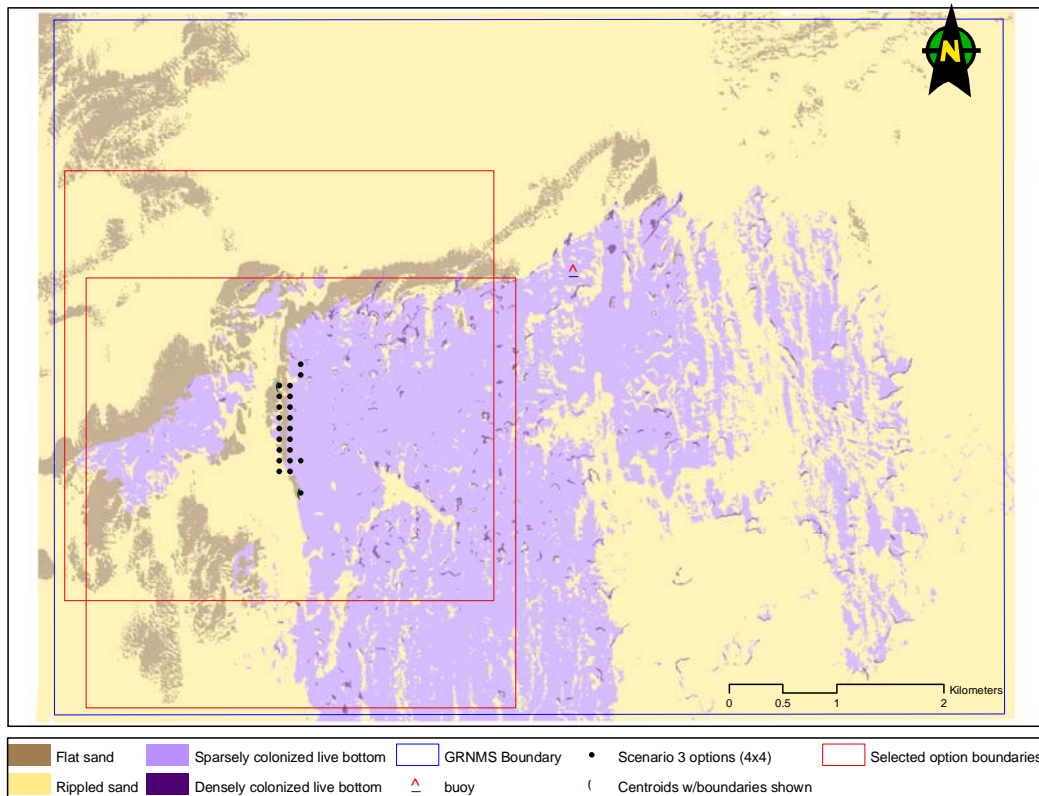


Figure 5. Compromise Option Boundary.

Fishing Alternatives

1. Prohibit all fishing in the research area (preferred)

The final 2008 RAWG and Sanctuary Advisory Council recommendations to GRNMS management included the unanimous recommendation that all fishing be prohibited in the research area. The 2005 RAWG recommendation to allow pelagic fishing assumed that trolling for coastal pelagic fish species does not involve “bottom-impinging” activities or gear types. The RAWG and Advisory Council finding is that the assumption is not always true; sport fishermen sometimes utilize methods to fish both coastal pelagic and reef species at the same time.

Scientists are also beginning to understand the relationship between benthic and pelagic species and their interactions. Participants in a 2005 scientific workshop examined the current knowledge on benthic-pelagic linkages in US marine ecosystems. They concluded that while local benthic-pelagic linkages will differ, linkages can generally be expected to be stronger and more direct in shallow water (<50 m.) habitats (Grober-Dunsmore et al. 2008). GRNMS ranges from approximately 17-21 meters in depth. They also concluded that there are many circumstances in which ecologically important

interactions are likely to be complex, unpredictable, and/or poorly understood. Local ecological factors contributing to complex linkages include multiple interactions within and among trophic levels (e.g., with mid-water forage or bait fish); complex behaviors and life histories among key local species; the ephemeral appearance of highly mobile predators; and/or the size of pelagic predator populations.

There are reef-associated species at GRNMS, like the jacks and great barracuda, that have a significant role in reef health, but that role is not well understood. Preliminary results from research in progress indicate that jacks, mackerels and great barracuda drive schools of baitfish from the water column down to the bottom, where the bait provides feeding opportunities for bottom-dwelling grouper and snapper (http://graysreef.noaa.gov/fish_behavior.html). Further understanding of benthic-pelagic interactions would benefit sustainable management of commercially-important fish species for the future. Setting aside an area where no harvest is permitted would allow researchers to begin to study these interactions and to determine how fishing impacts both benthic and pelagic species.

In deliberations over restrictions in certain Channel Islands National Marine Sanctuary (CINMS) MPAs, NOAA determined that all fishing should be prohibited. Fishermen argued that pelagic fishing would not compromise the usefulness of the MPAs, but NOAA determined that while the MPAs are not expected to yield the same benefits for pelagic species, there are likely to be positive ecological benefits of protecting these species while they are within the MPAs (NMSP 2007). Many of these species play important roles as apex predators within the marine ecosystem. Their removal from the system may lead to trophic cascades that change the ecosystem structure, in some cases altering the composition and productivity of the system. In addition, enforcement agents would have to make on-water determinations as to the type and disposition of gear, the species being taken, and the location of the vessel, complicating an already complicated job.

In terms of enforcement, researchers studying recovery of gag grouper populations in MPAs in the Gulf of Mexico, where benthic fishing is prohibited, reported that trolling activities were causing serious enforcement problems (David 2003). Law enforcement personnel were not able to distinguish the depth of trolling from the surface, and therefore could not determine if fishermen are not in fact fishing for bottom species.

The challenges to law enforcement officials at GRNMS and to users wanting to comply with the restrictions in a research area are greatly simplified with a no fishing decision. Officials who are charged with enforcing a pelagic-fishing-only rule could encounter numerous complications with fishing gear combinations. As noted above, examples of combined pelagic and bottom-fishing techniques are sometimes used in the southeast.

As discussed above, increasing evidence of linkages between benthic and pelagic communities in the marine environment, and the concerns for law enforcement, lead to the conclusion that prohibiting all fishing in the research area would benefit the sanctuary and its partners. In addition, should the Southern Option Boundary be chosen as the

boundary for the research area, the social and economic impacts would be minimal totaling an estimated 0.12 per cent of all saltwater fishing expenditures in Georgia (Appendix C).

Prohibiting all fishing in the research area is the preferred alternative to meet the purpose and need of a research (control) area. Given the evidence of linkages between benthic and pelagic resources and the concerns about law enforcement complications due to the potential for mixed pelagic and bottom-fishing methods, no fishing in the research area is NOAA's preferred alternative.

2. Allow trolling for pelagic species only

The original recommendations received from the RAWG in 2005 (NMSP 2006) promoted the idea that all bottom-impinging fishing gear (i.e., bottom fishing) should be eliminated from a research area. Much of the purpose of the research area is to determine impacts from bottom fishing and bottom-fishing gear on the resources of GRNMS, so the research (control) area must be free from bottom-fishing activities. It was thought that fishing for coastal pelagic species (e.g. king mackerel) could, however, be allowed without compromising the integrity of the research area.

The 2005 RAWG recommendation to allow pelagic fishing assumed that trolling for coastal pelagic fish species does not involve "bottom-impinging" activities or gear types. However, as discussed above in the preferred alternative for prohibiting all fishing in the research area, that assumption is not always true. In addition, scientists are beginning to understand important connections between benthic and pelagic marine fish species. Therefore, this was not the preferred alternative.

3. Allow trolling for pelagic species during tournaments only

A series of fishing tournaments for king mackerel are held generally beginning in May and extending into September and are based out of ports in northern Florida, Georgia and southern South Carolina. Boat sightings in GRNMS increase substantially during tournament days (NMSP 2006). There are generally more boats sighted in GRNMS during warm weather months in addition to boats drawn for tournament or pre-tournament fishing.

Scientists have expressed concerns that the integrity of a research area would be severely compromised if any fishing were allowed in a research area even a few days during the year. Adjusting study results for those impacts could be difficult to impossible. In addition, many tournaments can draw 100 or more boats in one day, making law enforcement extremely difficult and increase the potential for marine debris deposited in the research area if any fishing were allowed in the research area. Therefore, NOAA does not prefer this alternative.

Diving Alternatives

1. Prohibit all diving in the research area (preferred)

The issue of diving in the research area drew substantial discussion from RAWG and Advisory Council members throughout the process. While it is estimated that few visitors dive in GRNMS due to the open-ocean conditions and uncertain visibility, the purposes of a research area could be compromised by even seemingly small interferences. Enforcement of prohibitions on other boat-based activities if diving continues was also a concern expressed by many. On the other hand, some argued that supervised diving should be allowed to demonstrate the effects of the research area. Simply allowing recreational diving as it now occurs in the sanctuary without any restrictions was not acceptable to the majority of participants in the process.

Under this alternative, all recreational diving would be prohibited in the research area. Recreational diving in the remainder of the sanctuary would continue under current regulations. This alternative is more likely to ensure the integrity of a research area by eliminating the potential for interference with natural ecosystem function, research experiments or monitoring, and other intended or unintended violations or disturbances. Ultimately, the majority recommendation from the Sanctuary Advisory Council was that any recreational diving activity would make law enforcement difficult, would complicate compliance and could potentially negate the validity of a research area. Law enforcement also noted that having all users eliminated from the research area would enhance public assistance; if users know that the only visitors permitted to dive are researchers in a marked vessel, they are more likely to report violations.

Prohibiting all recreational diving in the research area is the preferred alternative to meet the purpose and need of a research (control) area. Under this alternative NOAA would continue to issue permits to dive for research, management, and salvage and recovery operations.

2. Allow recreational diving by permit only in the research area

Under this alternative, recreational diving in the research area would be allowed under permit from GRNMS. If approved, the permit and relevant applicant information would be forwarded to law enforcement officials and the holder of the permit would be required to submit a follow-up report. The permit would be conditioned as needed to protect the integrity of the research area and designate where in the research area diving would be permitted and where diving would be prohibited.

The majority recommendation from the Sanctuary Advisory Council was that any recreational diving activity would make law enforcement difficult, would complicate compliance and could potentially negate the validity of a research area. Prohibiting all diving in the research area is the preferred alternative to meet the purpose and need of a research (control) area. Allowing recreational diving by permit is, therefore, is not NOAA's preferred alternative.

Vessel Transit Alternatives

1. Allow vessel transit without interruption (stopping)

Under this alternative, boaters would be allowed to transit through the research area but without stopping except for law enforcement or emergency purposes. Because it is difficult to determine from a distance what a boater may be doing, and because a violator may hide evidence as law enforcement rangers approach, the burden of proof of a violation is significant. RAWG and Advisory Council members, however, agreed that to prohibit transit would be a hardship for many boaters although no entry would simplify law enforcement. Boaters would not be required to go around the research area, which can increase fuel and other costs.

Law enforcement officials have expressed concerns that enforcement of fishing and diving prohibitions would be severely impeded if stopping in the research area while transiting were allowed. Given the potential hardship to boaters if transit were prohibited, transit with no interruption (stopping) is preferred. In combination with diving and fishing prohibitions, transit without stopping except for law enforcement or emergency purposes, is NOAA's preferred alternative.

2. Allow vessel transit through and stopping in the research area

Under this alternative boaters would be allowed to transit through the research area and stop within the area. This alternative creates a significant burden of proof for law enforcement since it is difficult to determine from a distance what a boater may be doing, and because a violator may hide evidence as law enforcement rangers approach. RAWG and Advisory Council members, however, agreed that to prohibit transit would be a hardship for many boaters although no entry would simplify law enforcement. Boaters would not be required to go around the research area, which can increase fuel and other costs.

Law enforcement officials have expressed concerns that enforcement of fishing and diving prohibitions would be severely impeded if stopping in the research area while transiting were allowed. Stopping in transit is, therefore, not NOAA's preferred alternative.

Alternatives Considered and Eliminated

1. Boundary Options Eliminated

Delineate the southeast quadrant as a research area within GRNMS

Under this boundary alternative, the southeast quadrant (Figure 6) of the sanctuary would be designated as a research area. This option, which was suggested by some users of GRNMS, would encompass approximately 9 per cent of the boats sighted, which meets the criteria to minimize user displacement. However, the absence of sufficient ledge

habitat (22 short, 25 medium, and 23 tall ledges), and the absence of flat sand makes this boundary option unsuitable for a research area.

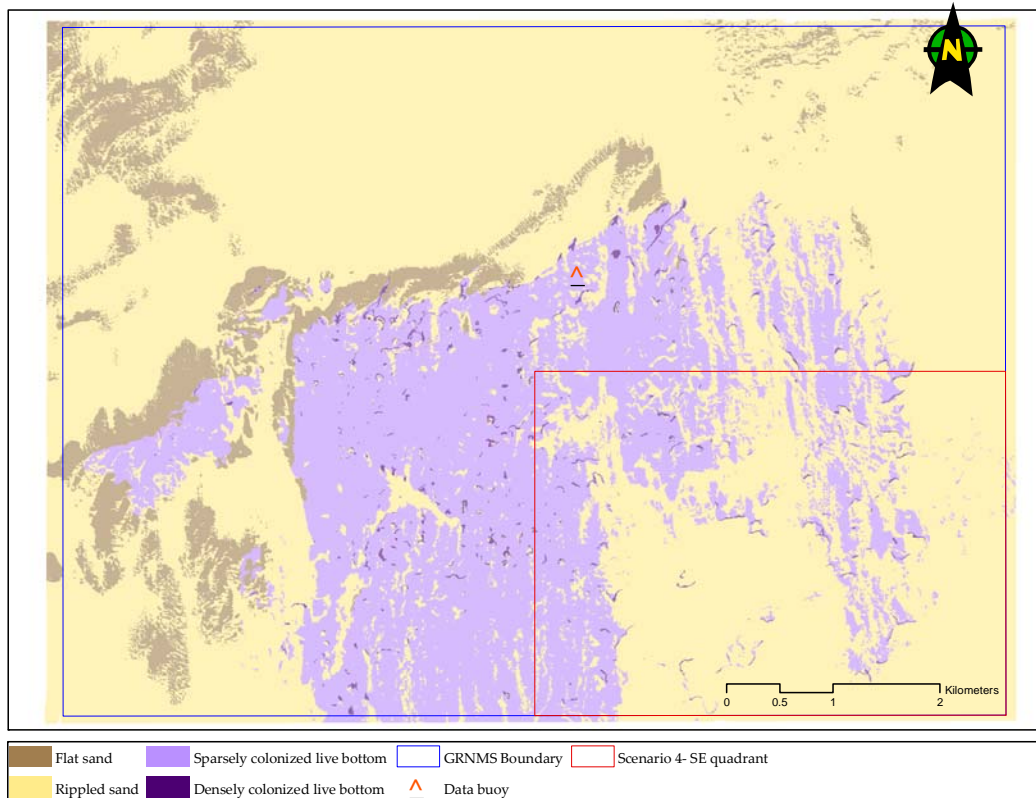


Figure 6. Southeast Quadrant Option Boundary.

Delineate the southwest quadrant as a research area within GRNMS

Under this boundary alternative, the southwest quadrant (Figure 7) of the sanctuary would be designated as a research area. This option would encompass approximately 10 per cent of the boats sighted in the sanctuary, which meets the criteria to minimize user displacement. However, the absence of sufficient ledge habitat (21 tall ledges) makes this boundary option unsuitable for a research area.

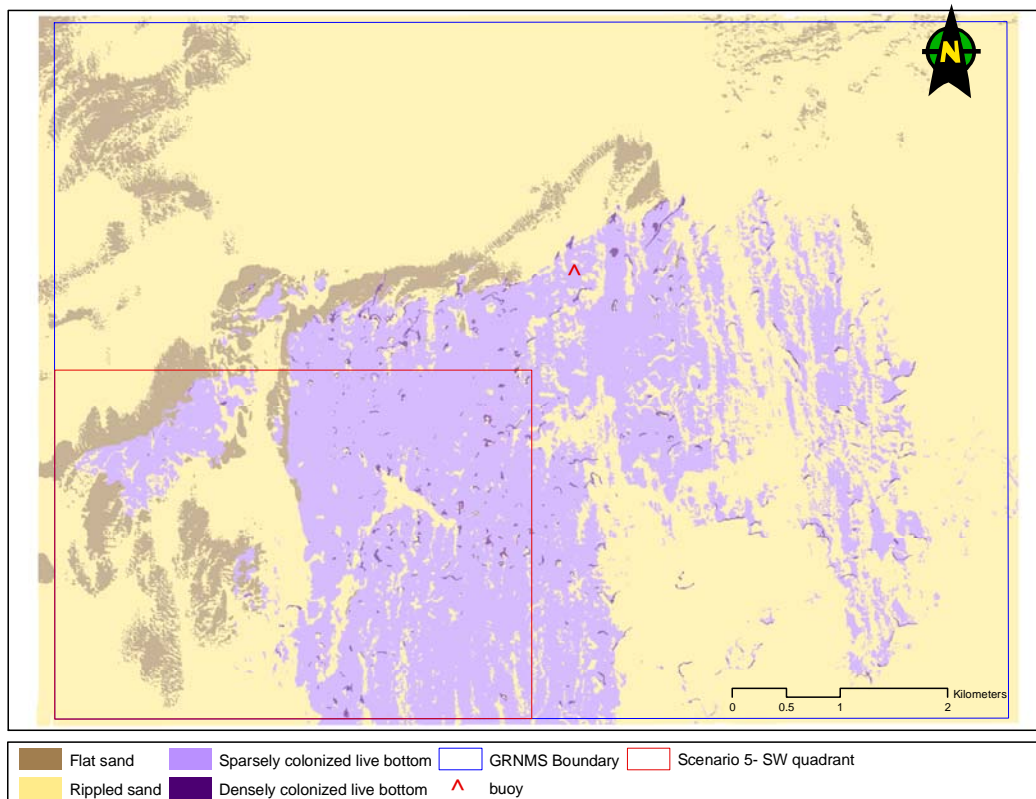


Figure 7. Southwest Quadrant Option Boundary.

MODEL REGULATORY LANGUAGE FOR SAFMC (PREFERRED ALTERNATIVE)

The following regulatory language (bold) is provided as a guide to assist the SAFMC in its consideration of providing draft NMSA fishing regulations. Additional regulatory language shown below that would address non-fishing activities (e.g., diving) would be promulgated by ONMS but has been provided here to the SAFMC in the interest of completeness.

Under the preferred alternative, Part 922, Subpart I would be amended by inserting the following section:

§ 922.94 Prohibited or otherwise regulated activities – Research area.

In addition to the prohibitions set out in 922.92, which apply throughout the Sanctuary, the following activities are prohibited and thus unlawful for any person to conduct or cause to be conducted within the research area described in Appendix ____ to this subpart, except as specified in paragraphs (a) and (b) of Sec. 922.92:

(1)(i) Injuring, catching, harvesting, or collecting, or attempting to injure, catch, harvest, or collect, any marine organism, or any part thereof, living or dead.

(ii) There shall be a rebuttable presumption that any marine organism or part thereof referenced in this paragraph found in the possession of a person within the research area has been collected from the research area.

(2) Except for possessing fishing gear or means for fishing stowed and not available for immediate use while passing through the research area without interruption or for valid law enforcement purposes, possessing, carrying, or using any fishing gear or means for fishing.

(3) Diving.

Conforming amendments would be made to sections 922.92 and 922.93 to ensure proper cross referencing to the newly inserted section.

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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 A

Purposes and policies of the NMSA of 1972, 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 B

GRNMS Goals and Objectives

The following sanctuary “Goals and Objectives” were developed with the Sanctuary Advisory Council in 2000 (NMSP 2006) and are consistent with the purposes and policies set forth by the NMSA.

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

Objectives

- a. Develop, implement, and periodically evaluate a comprehensive resource protection plan tailored to sanctuary resources and uses that provides direction for resource management and protection.
- b. Develop, implement, and maintain an on-site management capability that reviews and assesses resource conditions and human activities, and recommends action if problems arise.
- c. Develop, implement, and maintain the surveillance and enforcement presence needed to ensure compliance with sanctuary regulations and adequate protection of sanctuary resources.
- d. Inform and educate the public users on the sensitive nature of the sanctuary resources, the purpose of sanctuary designation, and the need for sanctuary regulations with enforcement.

GOAL 2: Support, promote, and coordinate scientific research and long-term monitoring to enhance the understanding of the sanctuary environment and to improve management decision-making.

Objectives

- a. Develop, implement, and periodically evaluate a comprehensive research and monitoring plan that looks over a five-year horizon, and that is based on existing knowledge of ecosystems, socioeconomic conditions, and evolving management issues.
- b. Encourage and support resource and socioeconomic research and monitoring that addresses priority information needs.
- c. Provide a means for information exchange among managers, scientific investigators, user groups, and the public.
- d. Ensure the ability to rapidly respond to unforeseen events.

GOAL 3: Enhance public awareness, understanding, wise and sustainable use, and appreciation of the marine environment and the sanctuary’s natural, historical, cultural, and archeological resources.

Objectives

- a. Develop, implement, and periodically evaluate a comprehensive education and outreach plan to broaden public support for the protection of sanctuary resources.

- b. Promote the sanctuary as a resource for educational, interpretive, commercial, and recreational use consistent with the primary objective of resource protection.
- c. Provide mechanisms to engage the public in sanctuary planning activities and evaluation.

GOAL 4: Facilitate, to the extent compatible with the primary objective of resource protection, all public and private uses of the sanctuary not prohibited pursuant to other authorities.

Objectives

- a. Facilitate uses of the sanctuary that are consistent with the primary objective of resource protection.
- b. Establish a means to monitor sanctuary use and resource quality over time to minimize potential user conflicts and environmental degradation.

GOAL 5: Dedicate appropriate infrastructure and resources for all programs, and create models of, and incentives for, ways to conserve and manage sanctuary resources, including the application of innovative management techniques.

Objectives

- a. Develop, implement, and periodically evaluate a comprehensive operation plan to coordinate activities related to the sanctuary.
- b. Evaluate the effectiveness of the plan on an annual basis and initiate changes as necessary.
- c. Identify the roles and responsibilities of parties involved in sanctuary administration and specify procedures for implementing essential components of the management plan.

GOAL 6: 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 to encourage the conservation of these resources.

Objectives

- a. Collaborate with other organizations to enhance opportunities for research priorities related to sanctuary ecosystems and resource management.
- b. Collaborate with other public and private organizations to promote communication and cooperation between sanctuary management and sanctuary users.
- c. Cooperate with international programs encouraging conservation of marine resources.

APPENDIX C

Economic Analysis of Recreational Fishing in the Proposed GRNMS Research Area April 2008

Rationale: Determine the economic impact of saltwater fishing in Georgia, and prorate that based on angler activity in Gray's Reef National Marine Sanctuary.

Georgia Saltwater Fishing Statistics 2006:

146,000 Georgia Saltwater Anglers

1,707,000 Georgia Saltwater Fishing Days

Total Economic Impact of Saltwater Fishing in Georgia in 2006:

Total Expenditures	\$119,250,000
Total Impact – Sales	\$153,361,000
Total Impact – Income	\$ 63,021,000
Total Impact – Employment	\$ 1,892

Sources:

American Sportfishing Association, Sportfishing in America, January 2008

US Fish and Wildlife Service, 2006 National Survey of Fishing, Hunting and Wildlife Associated Recreation, 2006

NOAA, NMFS, Marine Angler Expenditures in the Southeast Region, 1999

NOAA, NMFS, The Economic Importance of Marine Angler Expenditures in the United States, 2004

Methodology and Assumptions

- GRNMS boat location data sources: multiple sources including aerial photography and on water GADNR patrol boat records.
- Boat location data span 1999 to 2007. 1,266 boat locations identified.
- Approximately 50 percent of these occurred on fishing tournament days. No difference in spatial distribution of kingfish tournament days compared with non-tournament days.
- Statistical analysis of boat location data estimated a typical year of person days of fishing within GRNMS.

Assumptions for GRNMS fishing analysis:

- All boats identified are fishing
- Average of 4 fishers per boat
- Trip expenditure profile of tournament boats provided by Georgia DNR
- Trip expenditure profile of private boats provided by NMFS MRFSS
- 50 percent private/rental and 50 percent charter/tournament
- 95 percent Georgia resident and 5 percent non-resident

This analysis assumes that all economic value associated with the area closed is lost. Any factor that could mitigate or off-set the level of impact is not addressed. The estimated impacts are thought of as “maximum potential losses” because humans have

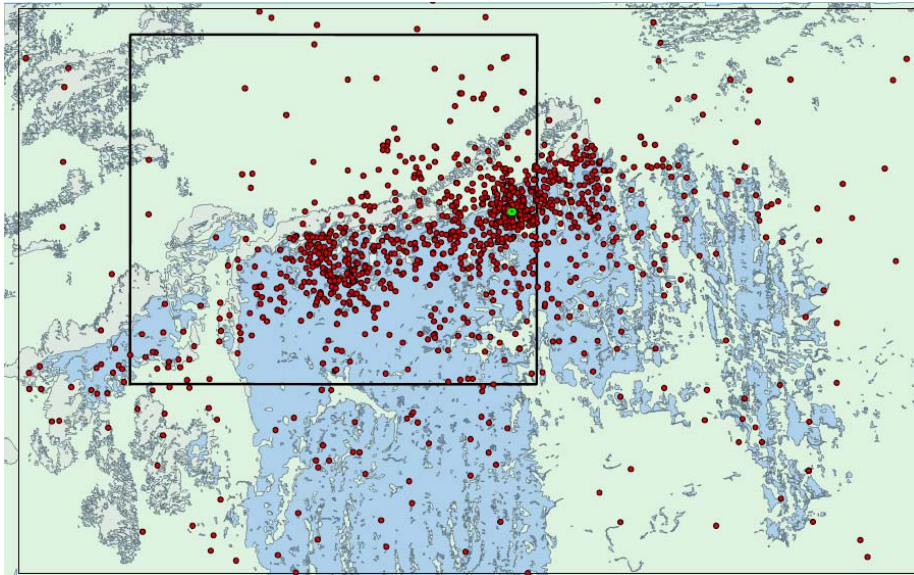
proven to be very adaptive, resilient and quite ingenious in responding to changes and rarely does society fail to at least mitigate or off-set most losses.

GRNMS Fishing Expenditures

4,694 person days = \$1,537,985 total fishing expenditures

GRNMS		Average Person Day Expenditures		Total Expenditures	
Trip Expenditures	Mode	Resident Spenders (\$)	Nonresident Spenders (\$)	Resident Spenders (\$)	Nonresident Spenders (\$)
Private Transportation	Tournament	13	13	28,985	1,526
	Private	7	10	15,324	1,142
Food	Tournament	6	6	13,378	704
	Private	14	35	31,862	4,135
Lodging	Tournament	100	100	222,965	11,735
	Private	301	27	670,368	3,168
Public Transportation	Tournament			-	-
	Private		41	-	4,814
Boat Fuel	Tournament	50	50		
	Private	24	23	54,103	2,686
Tournament Entry Fee	Tournament	100	100	222,965	11,735
Access/Boat Launching	Tournament	6	6	13,378	704
	Private	6	4	12,788	439
Equipment Rental	Tournament			-	-
	Private		11	-	1,306
Bait	Tournament	19	19	42,363	2,230
	Private	11	8	25,090	947
Ice	Tournament	6	6	13,378	704
	Private	2	3	5,396	318
Total	Tournament	300	300	668,895	35,205
	Private	365	162	814,931	18,954

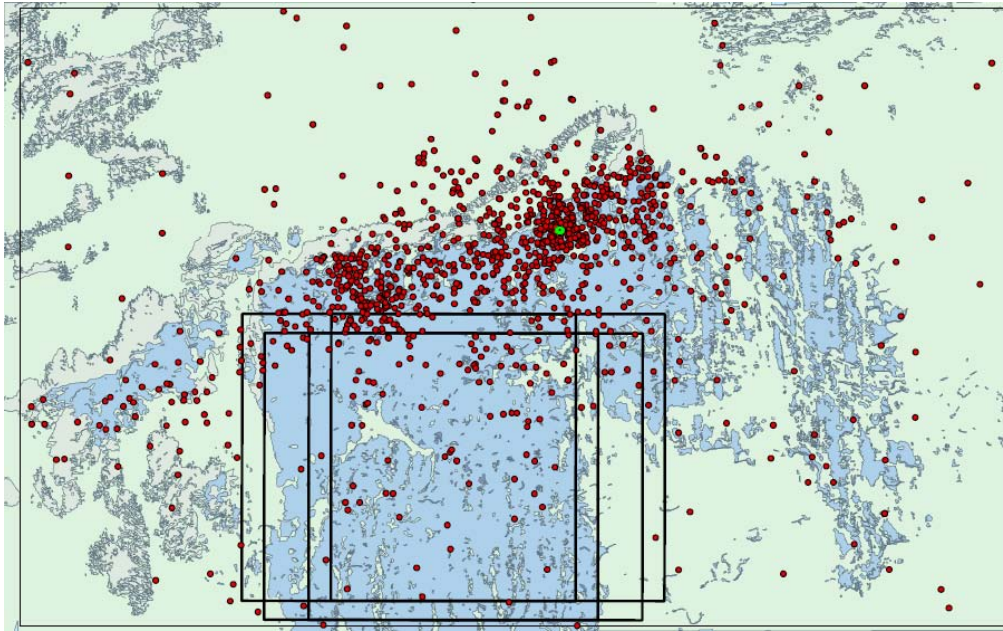
Optimal Scientific Option Boundary Economic Analysis:



Optimal Scientific Option Boundary Impacts to Fishing Expenditures
67.0 percent of fishing impacted = \$1,030,476

GRNMS		Expenditure Impacts Scenario 1	
Trip Expenditures	Mode	Resident Spenders (\$)	Nonresident Spenders (\$)
Private Transportation	Tournament	19,421	1,022
	Private	10,267	765
Food	Tournament	8,963	472
	Private	21,348	2,770
Lodging	Tournament	149,390	7,863
	Private	449,158	2,123
Public Transportation	Tournament	-	-
	Private	-	3,225
Boat Fuel	Tournament	-	-
	Private	36,250	1,799
Tournament Entry Fee	Tournament	149,390	7,863
Access/Boat Launching	Tournament	8,963	472
	Private	8,568	294
Equipment Rental	Tournament	-	-
	Private	-	875
Bait	Tournament	28,384	1,494
	Private	16,811	635
Ice	Tournament	8,963	472
	Private	3,615	213
Total	Tournament	448,171	23,588
	Private	546,017	12,699

Minimal User Displacement Option Boundary Economic Analysis



Minimal User Displacement Option Boundary Impacts to Fishing Expenditures

Boundary 1: 12.4 percent of fishing impacted = \$190,638

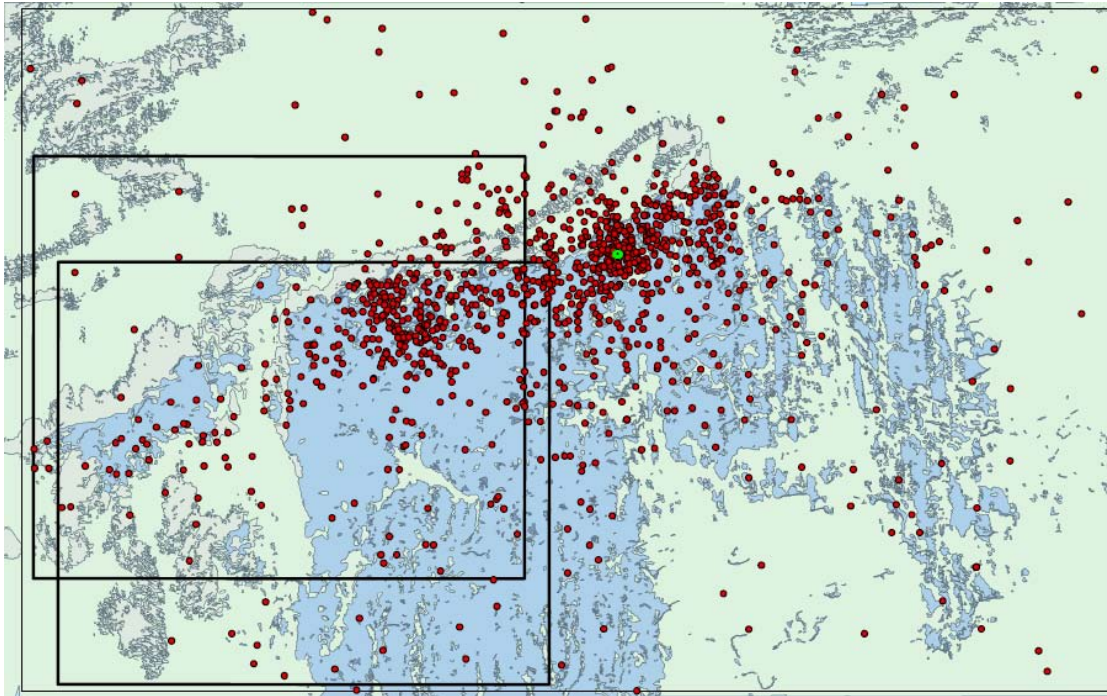
Boundary 2: 12.2 percent of fishing impacted = \$188,062

Boundary 3: 8.8 percent of fishing impacted = \$135,250

Boundary 4: 8.7 percent of fishing impacted = \$133,962

GRNMS		Expenditure Impacts Scenario 2, Boundary 1		Expenditure Impacts Scenario 2, Boundary 2		Expenditure Impacts Scenario 2, Boundary 3		Expenditure Impacts Scenario 2, Boundary 4	
Trip Expenditures	Mode	Resident Spenders (\$)	Nonresident Spenders (\$)	Resident Spenders (\$)	Nonresident Spenders (\$)	Resident Spenders (\$)	Nonresident Spenders (\$)	Resident Spenders (\$)	Nonresident Spenders (\$)
Private Transportation	Tournament	3,593	189	3,544	187	2,549	134	2,525	133
	Private	1,899	142	1,874	140	1,348	100	1,335	99
Food	Tournament	1,658	87	1,636	86	1,176	62	1,165	61
	Private	3,949	513	3,896	506	2,802	364	2,775	360
Lodging	Tournament	27,637	1,455	27,264	1,435	19,607	1,032	19,421	1,022
	Private	83,094	393	81,971	387	58,952	279	58,391	276
Public Transportation	Tournament	-	-	-	-	-	-	-	-
	Private	-	597	-	589	-	423	-	419
Boat Fuel	Tournament	-	-	-	-	-	-	-	-
	Private	6,706	333	6,616	328	4,758	236	4,712	234
Tournament Entry Fee	Tournament	27,637	1,455	27,264	1,435	19,607	1,032	19,421	1,022
Access/Boat Launching	Tournament	1,658	87	1,636	86	1,176	62	1,165	61
	Private	1,585	54	1,564	54	1,125	39	1,114	38
Equipment Rental	Tournament	-	-	-	-	-	-	-	-
	Private	-	162	-	160	-	115	-	114
Bait	Tournament	5,251	276	5,180	273	3,725	196	3,690	194
	Private	3,110	117	3,068	116	2,206	83	2,185	82
Ice	Tournament	1,658	87	1,636	86	1,176	62	1,165	61
	Private	669	39	660	39	475	28	470	28
Total	Tournament	82,912	4,364	81,791	4,305	58,822	3,096	58,262	3,066
	Private	101,013	2,349	99,648	2,318	71,665	1,667	70,982	1,651

Compromise Option Boundary Economic Analysis:



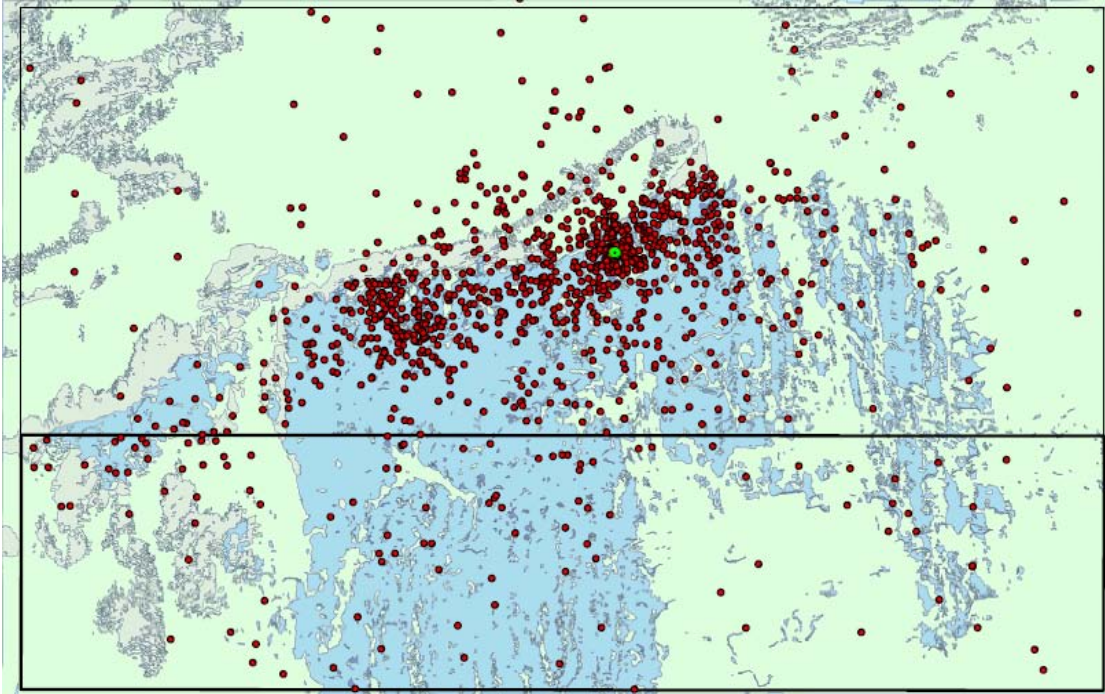
Compromise Option Boundary Impacts to Fishing Expenditures

Boundary 1: 35.9 percent of fishing impacted = \$552,593

Boundary 2: 34.6 percent of fishing impacted = \$531,983

GRNMS		Expenditure Impacts Scenario 3, Boundary 1		Expenditure Impacts Scenario 3, Boundary 2	
Trip Expenditures	Mode	Resident Spenders (\$)	Nonresident Spenders (\$)	Resident Spenders (\$)	Nonresident Spenders (\$)
Private Transportation	Tournament	10,414	548	10,026	528
	Private	5,506	410	5,300	395
Food	Tournament	4,807	253	4,627	244
	Private	11,448	1,486	11,021	1,430
Lodging	Tournament	80,111	4,216	77,123	4,059
	Private	240,861	1,138	231,878	1,096
Public Transportation	Tournament	-	-	-	-
	Private	-	1,730	-	1,665
Boat Fuel	Tournament				
	Private	19,439	965	18,714	929
Tournament Entry Fee	Tournament	80,111	4,216	77,123	4,059
Access/Boat Launching	Tournament	4,807	253	4,627	244
	Private	4,595	158	4,423	152
Equipment Rental	Tournament	-	-	-	-
	Private	-	469	-	452
Bait	Tournament	15,221	801	14,653	771
	Private	9,015	340	8,679	328
Ice	Tournament	4,807	253	4,627	244
	Private	1,939	114	1,866	110
Total	Tournament	240,332	12,649	231,368	12,177
	Private	292,802	6,810	281,882	6,556

Southern Option Boundary Economic Analysis



Southern Option Boundary Impacts to Fishing Expenditures

9.2 percent of fishing impacted = \$141,690

GRNMS		Expenditure Impacts Southern Expansion	
Trip Expenditures	Mode	Resident Spenders (\$)	Nonresident Spenders (\$)
Private Transportation	Tournament	2,670	141
	Private	1,412	105
Food	Tournament	1,232	65
	Private	2,935	381
Lodging	Tournament	20,541	1,081
	Private	61,759	292
Public Transportation	Tournament	-	-
	Private	-	443
Boat Fuel	Tournament	-	-
	Private	4,984	247
Tournament Entry Fee	Tournament	20,541	1,081
Access/Boat Launching	Tournament	1,232	65
	Private	1,178	40
Equipment Rental	Tournament	-	-
	Private	-	120
Bait	Tournament	3,903	205
	Private	2,311	87
Ice	Tournament	1,232	65
	Private	497	29
Total	Tournament	61,623	3,243
	Private	75,077	1,746

Summary of Economic Analyses

It is estimated that the economic impact of a research area on Georgia recreational fishing may be between 0.11% and 0.86% of statewide saltwater fishing expenditures. This is considered to the maximum potential loss.

Scenario #	Boundary #	% GRNMS Impacted	Impacted GRNMS Person Days	Impacts to GRNMS Saltwater Fishing Expenditures	% Impact to GA Person Days of Saltwater Fishing	% Impact to GA Total Saltwater Fishing Expenditures
1	1	67.0%	3,145	\$1,030,476	0.18%	0.86%
2	1	12.4%	582	\$190,638	0.03%	0.16%
2	2	12.2%	574	\$188,062	0.03%	0.16%
2	3	8.8%	413	\$135,250	0.02%	0.11%
2	4	8.7%	409	\$133,962	0.02%	0.11%
3	1	35.9%	1,687	\$552,593	0.10%	0.46%
3	2	34.6%	1,624	\$531,983	0.10%	0.45%
4	1	6.7%	315	\$103,048	0.02%	0.09%
5	1	14.5%	680	\$222,840	0.04%	0.19%
Southern Expansion		9.2%	432	\$141,690	0.03%	0.12%