



PUBLIC HEARING DRAFT

**FISHERY ECOSYSTEM PLAN
OF THE SOUTH ATLANTIC REGION
VOLUME I: INTRODUCTION AND OVERVIEW**

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ABBREVIATIONS AND ACRONYMS

ABC	Acceptable Biological Catch
ACCSP	Atlantic Coastal Cooperative Statistics Program
ACE	Ashepoo-Combahee-Edisto Basin National Estuarine Research Reserve
APA	Administrative Procedures Act
AUV	Autonomous Underwater Vehicle
B	A measure of stock biomass either in weight or other appropriate unit
B_{MSY}	The stock biomass expected to exist under equilibrium conditions when fishing at F_{MSY}
B_{OY}	The stock biomass expected to exist under equilibrium conditions when fishing at F_{OY}
B_{CURR}	The current stock biomass
CEA	Cumulative Effects Analysis
CEQ	Council on Environmental Quality
CFMC	Caribbean Fishery Management Council
CPUE	Catch per unit effort
CRP	Cooperative Research Program
CZMA	Coastal Zone Management Act
DEIS	Draft Environmental Impact Statement
EA	Environmental Assessment
EBM	Ecosystem-Based Management
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EFH-HAPC	Essential Fish Habitat - Habitat Area of Particular Concern
EIS	Environmental Impact Statement
EPAP	Ecosystem Principles Advisory Panel
ESA	Endangered Species Act of 1973
F	A measure of the instantaneous rate of fishing mortality
$F_{30\%SPR}$	Fishing mortality that will produce a static SPR = 30%.
$F_{45\%SPR}$	Fishing mortality that will produce a static SPR = 45%.
F_{CURR}	The current instantaneous rate of fishing mortality
FMP	Fishery Management Plan
F_{MSY}	The rate of fishing mortality expected to achieve MSY under equilibrium conditions and a corresponding biomass of B_{MSY}
F_{OY}	The rate of fishing mortality expected to achieve OY under equilibrium conditions and a corresponding biomass of B_{OY}
FEIS	Final Environmental Impact Statement
FMU	Fishery Management Unit
FONSI	Finding Of No Significant Impact
GOOS	Global Ocean Observing System
GFMC	Gulf of Mexico Fishery Management Council
IFQ	Individual fishing quota
IMS	Internet Mapping Server
IOOS	Integrated Ocean Observing System
M	Natural mortality rate
MARMAP	Marine Resources Monitoring Assessment and Prediction Program

MARFIN	Marine Fisheries Initiative
MBTA	Migratory Bird Treaty Act
MFMT	Maximum Fishing Mortality Threshold
MMPA	Marine Mammal Protection Act of 1973
MRFSS	Marine Recreational Fisheries Statistics Survey
MSA	Magnuson-Stevens Act
MSST	Minimum Stock Size Threshold
MSY	Maximum Sustainable Yield
NEPA	National Environmental Policy Act of 1969
NMFS	National Marine Fisheries Service
NMSA	National Marine Sanctuary Act
NOAA	National Oceanic and Atmospheric Administration
NRC	National Research Council
OY	Optimum Yield
POC	Pew Oceans Commission
R	Recruitment
RFA	Regulatory Flexibility Act
RIR	Regulatory Impact Review
SAFE	Stock Assessment and Fishery Evaluation Report
SAFMC	South Atlantic Fishery Management Council
SEDAR	Southeast Data, Assessment, and Review
SEFSC	Southeast Fisheries Science Center
SERO	Southeast Regional Office
SDDP	Supplementary Discard Data Program
SFA	Sustainable Fisheries Act
SIA	Social Impact Assessment
SSC	Scientific and Statistical Committee
TAC	Total allowable catch
T_{MIN}	The length of time in which a stock could rebuild to B_{MSY} in the absence of fishing mortality
USCG	U.S. Coast Guard
USCOP	U.S. Commission on Ocean Policy
VMS	Vessel Monitoring System

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Introduction

1.0 Background Supporting Move to Ecosystem Based Management

Moving to Ecosystem-Based Management

Development of a South Atlantic Council Fishery Ecosystem Plan (FEP) provides a significant opportunity to review biological, ecological, social, and economic information for fisheries in the South Atlantic ecosystem. The Council views habitat conservation as the core of its move to ecosystem based management (EBM). The FEP significantly expands and updates the SAFMC Habitat Plan (SAFMC 1998) by providing comprehensive details on all managed species (SAFMC, South Atlantic States, ASMFC, and NOAA Fisheries Highly Migratory Species and Protected Species), including their biology, ecology, and food web dynamics and the economic and social characteristics of the fisheries. The FEP also updates the information for designating Essential Fish Habitat (EFH) and EFH-Habitat Areas of Particular Concern (HAPC). In addition, it summarizes existing research programs and identifies biological, social, and economic research needed to fully address EBM in the region. The FEP will serve as a source document that will, over time, present more detailed information describing the South Atlantic ecosystem and the impact of the fisheries on the environment. As a living document (primarily through expansions to Volume IV Threats and Recommendations), the FEP will provide a greater degree of guidance on incorporation of fishery, habitat, or ecosystem considerations into management actions, such as bycatch reduction, prey-predator interactions, maintenance of biodiversity, and identification of spatial management needs.

Evolving from a Habitat Network to an Ecosystem Network

Starting with its Habitat and Environmental Protection Advisory Panel, the Council fostered a network of stakeholders to develop the SAFMC Habitat Plan, which was completed in 1998 to support the EFH rule. The Council further expanded this network to support development of the FEP and Comprehensive Ecosystem-based Amendment (CE-BA) 1 and their coordination with other regional efforts. The Council has worked with the Southeast Coastal Regional Ocean Observing Association (SECOORA) to guide identification of priority needs for observation and modeling to support fisheries oceanography and integration of stock assessment process through the Southeast Data and Assessment Review (SEDAR). The Council is a member of the Southeast Aquatic Resource Partnership (SARP), and its Southeast Aquatic Habitat Plan (SARP 2008) provides watershed conservation restoration targets for the FEP and several habitat, water quality, and water quantity conservation needs identified in the FEP are directly addressed on the ground by projects supported through SARP. These cooperative efforts contribute to fish habitat restoration and conservation efforts needed to increase the viability of fish populations and fishing opportunities, including efforts to protect and

conserve EFH. Lastly, the Council has cooperated with South Atlantic states in the formation of a South Atlantic Governors' Alliance, which will provide additional guidance and resources for efforts by the states and Council to achieve broad habitat and ecosystem conservation goals.

Building Tools to Support EBM in the South Atlantic Region

To support EBM in the South Atlantic Region, the Council added a Habitat and Ecosystem section to its website

<http://www.safmc.net/ecosystem/Home/EcosystemHome/tabid/435/Default.aspx> and, in cooperation with the Florida Wildlife Research Institute (FWRI), developed a Habitat and Ecosystem Internet Map Server (IMS)

<http://www.safmc.net/EcosystemManagement/EcosystemBoundaries/MappingandGISData/tabid/62/Default.aspx>. Many groups contributed to the IMS, including NOAA Fisheries Service, state and local management authorities, universities, conservation organizations, and recreational and commercial fishers. Further development of ecosystem information systems to support Council management should build on existing tools (e.g., Ecosystem IMS) and provide funding to the Council and other regional cooperating partners to address long-term Council needs.

Implementing EBM

The Council has implemented ecosystem-based principles through existing fishery management actions including establishment of deepwater Marine Protected Areas for the Snapper Grouper fishery, proactive harvest control rules on species not overfished (e.g., dolphin and wahoo), extensive gear area closures that in most cases eliminate the impact of fishing gear on EFH, and Special Management Zones. Through CE-BA 1, the Council is taking an ecosystem approach to protect deepwater ecosystems while providing for traditional fisheries for golden crab and royal red shrimp in areas where they do not impact deepwater coral habitat. The Council's stakeholder-based process taps an extensive network of scientific, management, and fishery professionals within the region, and the Council has invested significantly in tools to maintain this engagement over the long term.

Ecosystem Approach to Deepwater Ecosystem Management

The Council manages coral, coral reefs, and live/hard bottom habitat, including deepwater corals, through the Fishery Management Plan for Coral, Coral Reefs and Live/Hard Bottom Habitat of the South Atlantic Region (Coral FMP). Mechanisms exist in the FMP, as amended, to further protect deepwater coral and live/hard bottom habitats. The Council's Habitat and Environmental Protection Advisory Panel and Coral Advisory Panel have supported proactive efforts to identify and protect deepwater coral ecosystems in the South Atlantic region. Management actions proposed in CE-BA 1 include the establishment of deepwater coral HAPCs (C-HAPCs) to protect over 23,000 square miles of habitat that is thought to be the largest continuous distribution of pristine deepwater coral ecosystems in the world.

Scope of FEP Development

While the FEP will support and guide EBM, most of the Council's implementation steps will be through CE-BAs. This approach will build on the biological, economic, and social information presented in the FEP, and provide the Council with the opportunity to evaluate needed actions across multiple fisheries and facilitate development of FMP amendments or measures that apply across FMPs. The Council has proposed updating the FEP every five years.

Future Challenges and Needed Resources to Fully Implement EBM in the Region

One of the greatest challenges to the long-term move to EBM is funding high priority research, including comprehensive benthic mapping, ecosystem modeling, and management tool development. In addition, collecting detailed information on fishing fleet dynamics, including defining fishing operation areas by species, species complex, and season, as well as catch relative to habitat, is critical for assessment of fishery, community, and habitat impacts and for use of place-based management measures. Additional resources need to be dedicated to expand coordination of modeling, mapping, and characterizing habitat use and to fully fund regional fishery independent surveys (e.g., MARMAP and SEAMAP). One high-priority need is completion of the mapping of near-shore, mid-shelf, shelf edge and deepwater habitats in the South Atlantic region.

The combined FEP and CE-BA development process complements, but does not replace, existing FMPs. The FEP serves as an evolving source document that, in combination with the development of future CE-BAs, to consider individual management needs as well as needs across fisheries in the South Atlantic Region. It is anticipated that in the development of future FEPs, the Council will draw on Stock Assessment and Fishery Evaluation (SAFE) reports, which NMFS is required to provide the Council for all FMPs implemented under the Magnuson-Stevens Act. The FEP, serving as the source document for CE-BAs, could also meet NMFS SAFE requirements if information is provided to the Council to update necessary sections.

Guiding Principles and Recommendations

In closing this section of the FEP, the Council notes U.S. Commission on Ocean Policy and Pew Oceans Commission describe EBM as a process that allows ocean and coastal resources to be managed to reflect the relationships among all ecosystem components, including humans (USCOP 2004). Using the Commission's guiding principles for EBM, the Council notes the following efforts to implement those guidelines:

Guiding principles for EBM

- **Sustainability** – the Council's goal is to conserve and manage South Atlantic fishery resources. In addition, the Council provides for the long-term conservation of benthic and pelagic habitats and has reduced or eliminated the impact of fishing activities on EFH
- **Stewardship** – the Council strives to balance different uses of fishery resources in the South Atlantic EEZ

- Ocean-Land-Atmosphere Connections – the Council is actively engages partnerships that aim to characterize ocean-land connections (e.g., Ocean Observing Systems) in order to integrate findings into management
- Ecosystem-Based Management – the Council has been working with partners since 2002 to develop the FEP and CE-BA
- Multiple Use Management – the Council uses diverse management strategies to ensure sustainability of regional resources
- Preservation of Marine Biodiversity – examples of actions include EFH, EFH-HAPCs, Oculina Bank HAPC, Oculina Experimental Closed Area, proposed deepwater coral HAPCs, MPAs, and Special Management Zones
- Best Available Science and Information – the Council is directed to use best available science and through stock assessments developed through SEDAR. In addition, guidance is provided by the Council’s Scientific and Statistical Committee (SSC), Species and Technical Advisory Panels
- Participatory Governance – the Council relies on its Habitat, Coral, and many other Advisory Panels whose members represent all stakeholders; scoping meetings, public hearings, workshops, and Council meetings provide the public numerous opportunities to participate in the process

Specific recommendations on EBM

- Develop Regional Ecosystem Assessments – the Council’s FEP consolidates best available scientific information on the South Atlantic ecosystem into a single document that will be updated periodically
- Employ Marine Protected Areas as a Management Tool – the Council has undertaken an extensive process to design and implement MPAs under its Snapper Grouper FMP; Amendment 14 would establish a network of MPAs and is currently being reviewed by the Secretary of Commerce
- Improve Habitat Conservation and Restoration – the Council emphasizes the conservation of habitat through several FMPs (e.g., direct gear prohibitions, EFH and EFH-HAPCs) and through habitat policies and commenting on projects that impact EFH and EFH-HAPCs
- Develop Prioritized Management Information Needs – the FEP contains Research and Monitoring Plans for the Oculina Closed Area and Deepwater Coral Ecosystems as well as identifying fish, habitat, and human information needs in the South Atlantic region
- Enhance Data Needs for Recreational Fisheries – the Council is evaluating requiring permits for all commercial and recreational fishermen to fish for, harvest, or possess any resource in the EEZ
- Enhance Cooperative Research – the Council is directly involved in the cooperative research program in the South Atlantic and is pushing to fill our data gaps
- Establish Dedicated Access Privileges – the Council employs this approach to manage wreckfish in the EEZ and is evaluating implementing a Limited Access Privilege Program (LAPP) for the golden tilefish fishery
- Maximize the Use of VMS for Fishery-Related Activities – the Council requires VMS on rock shrimp vessels, is proposing requiring the use of VMS in the golden

crab fishery and will evaluate the need to require VMS on other fishing vessels in future comprehensive ecosystem amendments

- Expand EFH designations – the Council is exploring available analytical methods to refine and expand EFH designations and will address the possible designation of new EFH-HAPCs as has been proposed by the Habitat Advisory Panel through CE-BA 2
- Address Environmental Impacts of Aquaculture – the Council approved a Policy Statement on Marine Aquaculture developed through its Habitat Advisory Panel
- Address Environmental Impacts of Offshore Oil and Gas Production – the Council updated its policy on energy development and transportation (and offshore renewable energy development) with advice from its Habitat and Coral Advisory Panels
- Regulate Destructive Fishing Gear – the Council already has regulations in place to protect habitat from destructive fishing gear; for example prohibition on use of all fish traps, black sea bass pots south of Cape Canaveral Florida, roller-rig trawls, and entanglement nets in the snapper grouper fishery; prohibition on use of longlines shallower than 50 fathoms; and prohibition of bottom longlines in the wreckfish fishery. The Council intends to further protect habitat from damaging gear by prohibiting the use of bottom trawls, mid-water trawls, bottom longlines, and fish traps and pots, anchors chains and grapples in deepwater CHAPCs
- Reduce Bycatch – the Council strongly supports the continued implementation of ACCSP to have better access to bycatch data to inform management decisions; bycatch reduction devices (BRDs) are required in penaeid and rock shrimp fisheries; use of fish traps, trawls and entanglement nets is prohibited in the snapper grouper fishery; use of drift gill nets is prohibited in the coastal migratory pelagic fishery; and use of bottom longlines is prohibited inshore of 50 fathoms and retention of anything but deepwater snapper grouper species when using the gear
- Improve the Management of U.S. Coral Resources – the Council protects coral, coral reefs, and live/hard bottom habitat in the South Atlantic EEZ through harvest and gear restrictions in the Coral and Snapper Grouper FMPs and Amendments. All coral harvest is prohibited except allowable octocorals (small quota) and aquacultured live rock. The Council is now proposing designation of deepwater Coral HAPCs to protect vulnerable deepwater coral communities
- Commit to Creation of the IOOS – the Council as a member of the SECOORA Steering Committee and recently elected member of the Board of Directors is facilitating expanding the observing systems ability to meet fishery oceanography monitoring and assessment needs that will support an ecosystem approach to the management of fishery resources in the South Atlantic
- Enhance Data and Information Management – the Council has developed, in cooperation with the Florida Fish and Wildlife Conservation Commission, a Habitat and Ecosystem Internet Mapping Server and Section of the Council’s website to support the move to ecosystem management and disseminate data and information to a broad user body

1.1 *Habitat protection and ecosystem management responsibilities as defined in the Magnuson-Stevens Act*

Essential Fish Habitat and Essential Fish Habitat Areas of Particular Concern

The Magnuson-Stevens Act defines EFH as “all waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity.” Regional Fishery Management Councils are directed to describe and identify EFH for each federally managed species, attempt to minimize the extent of adverse effects on habitat caused by fishing and non-fishing activities, and identify actions to encourage conservation and enhancement of those habitats. It is required that EFH be based on the best available scientific information. EFH may include habitat for an individual species or an assemblage of species, whichever is appropriate within each FMP. “Waters” includes aquatic areas and their associated physical, chemical, and biological properties that are utilized by fish; when appropriate, “waters” includes areas used historically. Water quality includes turbidity and concentrations of nutrients and dissolved oxygen. Examples of “waters” that may be considered EFH, include open waters, wetlands, estuarine habitats, riverine habitats, and wetlands hydrologically connected to productive water bodies.

“Necessary” means the habitat required to support a sustainable fishery and a healthy ecosystem, while “spawning, breeding, feeding, or growth to maturity” covers the full life cycle of a species. “Substrate” includes sediment, hard bottom, structures underlying the waters, and associated biological communities. These communities could encompass mangroves, tidal marshes, mussel beds, cobble with attached fauna, mud and clay burrows, coral reefs and submerged aquatic vegetation. Migratory routes, such as rivers and passes serving as passageways to and from anadromous fish spawning grounds, should also be considered EFH. If appropriate, “substrate” may include artificial reefs, shipwrecks, and partially or entirely submerged structures, such as jetties. The Councils also must identify EFH-HAPCs, which are to be subsets of EFH and based on ecological function, sensitivity to human-induced environmental degradation, likelihood of development activities stressing the habitat type, or rarity.

Habitat Responsibilities as Defined in the Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Act provides the Secretary of Commerce and Fishery Management Council with authority and responsibility to protect EFH. Section 305 (b) Fish Habitat, directed the Secretary (through NOAA Fisheries Service) to establish by regulation guidelines to assist the councils in the description and identification of EFH in fishery management plans (including adverse impacts on such habitat). In addition, the Secretary (through NOAA Fisheries Service) was directed to set forth a schedule for the amendment of fishery management plans to include the identification of EFH and for the review and updating of such identifications based on new scientific evidence or other relevant information. Lastly, the Magnuson-Stevens Act directed the Secretary to coordinate with and provide information to other federal agencies to further the conservation and enhancement of EFH. The Magnuson-Stevens Act specifies that each

federal agency shall consult with the Secretary with respect to any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect EFH. Additional provisions specify that each Council:

1. May comment on and make recommendations to the Secretary and any Federal or State agency concerning any activity authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by any Federal or State agency that, in the view of the Council, may affect the habitat, including essential fish habitat, of a fishery resource under its authority
2. Shall comment on and make recommendations to the Secretary and any Federal or State agency concerning any such activity that, in the view of the Council, is likely to substantially affect the habitat, including essential fish habitat, of an anadromous fishery resource under its authority.

If the Secretary receives information from a Council or federal or state agency or determines from other sources that an action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by any state or federal agency would adversely affect EFH, the Secretary shall recommend agency measures that can be taken to conserve such habitat. Within 30 days after receiving a recommendation, a federal agency shall provide a detailed response in writing to any Council commenting and the Secretary regarding the matter. The response shall include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on such habitat. In the case of a response that is inconsistent with the recommendations of the Secretary, the federal agency shall explain its reasons for not following the recommendations. The Council's current process for reviewing and commenting on projects is described in the Appendix A of the Council's Habitat Plan (SAFMC 1998).

On January 17, 2002, the final rule was published in the Federal Register to implement the EFH provisions of the Magnuson-Stevens Act; the effective date of the rule was February 19, 2002. This rule supersedes the interim final rule published on December 19, 1997. The final rule establishes guidelines to assist the Regional Fishery Management Councils and the Secretary of Commerce in the description and identification of EFH in FMPs, including identification of adverse impacts from both fishing and non-fishing activities on EFH and identification of actions required to conserve and enhance EFH. The final rule provided procedures for consultation, coordination, and recommendations on permit activities and guidelines for EFH information in FMPs. The final rule also provided clearer guidelines for prioritizing and analyzing habitat effects for managed species and allows informed decision based on similar species and other life stages.

The FEP updates EFH information in the Council's Habitat Plan (SAFMC 1998) and refines information on habitat requirements (by life stage where information exists) for species managed by the Council. To develop this information the Council worked with its Habitat and Coral Advisory Panels and through a series of workshops identified available environmental and fisheries data relevant to describing and identifying EFH. In addition, the EFH workshops tapped habitat experts at the state, federal, and regional levels. In assessing the relative value of habitats, the Council is taking a risk-averse

approach. This approach will ensure that adequate areas are protected as EFH in the South Atlantic. Habitat loss and degradation may be contributing to species being identified as overfished, therefore all habitats used by these species are considered essential.

The distribution and geographic limits of EFH is described and where information exists presented by life history stage in maps that are part of the Council's online Habitat and Ecosystem IMS http://ocean.floridamarine.org/efh_coral/ims/viewer.htm. Maps developed to date by Council staff, Florida Marine Research Institute, NOAA Fisheries Service Southeast Fisheries Science Center, North Carolina DENR, and South Carolina DNR encompass appropriate temporal and spatial variability in presenting the distribution of EFH. Where information exists, seasonal changes are represented.

The Council's Habitat Plan (SAFMC 1998) and Volume IV of this FEP present information on adverse effects from fishing and describe management measures the Council has implemented to minimize adverse effects on EFH from fishing. Conservation and enhancement measures implemented by the Council may include ones that eliminate or minimize physical, chemical, or biological alterations of the substrate, and loss of, or injury to, benthic organisms, prey species, and other components of the ecosystem. The Council has implemented restrictions on fisheries to the extent that no significant activities were identified in the review of gear impact conducted for the NOAA Fisheries Service by Auster and Langton (1998), which presented available information on adverse effects of all fishing equipment types used in waters described as EFH. The Council has already prevented, mitigated, or minimized most adverse effects from most fisheries prosecuted within the South Atlantic exclusive economic zone (EEZ).

The Council has considered evidence that some fishing practices may have an identifiable adverse effect on habitat, and the Council is addressing those pertaining to deepwater coral ecosystems in CE-BA 1. The Council, as indicated in the previous section, already uses many options recommended in the guidelines for directly or indirectly managing adverse effects from fishing including: fishing equipment restrictions; seasonal and areal restrictions on the use of specified equipment (e.g., time/area closure); equipment modifications to allow the escape of particular species or particular life stages (e.g., juveniles); prohibitions on the use of explosives and chemicals; prohibitions on anchoring or setting equipment in sensitive areas; prohibitions on fishing activities that cause significant physical damage in EFH; time/area closures including closing areas to all fishing or specific equipment types during spawning, migration, foraging, and nursery activities; designating zones for use as marine protected areas to limit adverse effects of fishing practices on certain vulnerable or rare areas/species/life history stages, such as those areas designated as habitat areas of particular concern; and harvest limits.

Volume IV of this FEP identifies non-fishing activities that have the potential to adversely affect EFH quantity or quality. Examples of these activities are dredging, filling, mining, impounding waters, diverting waters, thermal discharges, non-point source pollution and sedimentation, introduction of hazardous materials or exotic species, and modifying converting aquatic habitat in ways that eliminate, diminish, or disrupt the

functions of EFH. The FEP includes an analysis of how fishing and non-fishing activities influence habitat function on an ecosystem or watershed scale. An assessment of the cumulative and synergistic effects of multiple threats, including the effects of natural stresses (such as storm damage or climate-based environmental shifts), and an assessment of the ecological risks resulting from the impact of those threats on EFH is included. General conservation and enhancement recommendations are included in Volume IV of the FEP. These include enhancement of rivers, streams, and coastal areas; protection of water quality and quantity; minimization of the destruction/degradation of wetlands; restoration and maintenance of the ecological health of watersheds, and replacement of lost or degraded EFH.

1.2 Fishery Ecosystem Plan and Comprehensive Fishery Ecosystem Plan Amendment development process

A 1999 congressionally-mandated report set the stage for subsequent federal efforts to implement EBM. In response to a congressional request, the National Marine Fisheries Service (NMFS) convened a panel of experts to assess the extent to which ecosystem principles are currently applied in fisheries research and management, and recommend how best to integrate these principles into future activities. This Ecosystem Principles Advisory Panel (EPAP) concluded that NMFS and the regional Fishery Management Councils do apply some EBM principles, goals and policies, but don't apply them comprehensively or evenly. They attributed this to the lack of a clear mandate and resources to carry out EBM, and the "considerable gaps in knowledge and practice" of this new concept. EPAP recommended that Councils continue to use Fishery Management Plans (FMPs) for single species and species complexes, but amend these to incorporate ecosystem approaches consistent with an overall Fishery Ecosystem Plan (FEP). The objectives of the FEP are:

- To provide Council members with a clear description and understanding of the physical, biological and human/institutional context of ecosystems;
- Direct how that information should be used within FMPs; and
- Set policies by which management options would be developed and recommended.

EPAP outlined eight elements that should be included in each FEP and recommended that the Magnuson-Stevens Act be amended to require FEPs. It urged the development of an initial demonstration FEP as a model to facilitate rapid implementation of a full FEP when ultimately required under Magnuson-Stevens. It also called on NMFS and the Fishery Management Councils to establish guidelines for FEP development.

The Council developed the South Atlantic FEP with the long-term vision of embracing the 8 elements presented by the EPAP:

1. Delineate the geographic extent of the ecosystem(s) that occur(s) within Council authority, including characterization of the biological, chemical, and physical dynamics of those ecosystems, and "zone" the area for alternative uses. Figure 1-1 shows the Council's management jurisdiction and the core area of the South Atlantic Ecosystem. Building on the scope of the Habitat Plan the area of consideration extends from the coastal watersheds including extent of anadromous and catadromous species to off the continental shelf through the extent of the Councils' jurisdiction. However, the South Atlantic ecosystem is invariably linked to other systems and cooperation and collaboration to link research efforts and share management considerations will be pursued.

2. Develop a conceptual model of the food web.
3. Describe the habitat needs of different life history stages for all plants and animals that represent the “significant food web” and how they are considered in conservation and management measures.
4. Calculate total removals – including incidental mortality – and show how they relate to standing biomass, production, optimum yields, natural mortality, and trophic structure.
5. Assess how uncertainty is characterized and what kind of buffers against uncertainty are included in conservation and management actions.
6. Develop indices of ecosystem health as targets for management.
7. Describe available long-term monitoring data and how they are used.
8. Assess the ecological, human, and institutional elements of the ecosystem which most significantly affect fisheries and are outside of Council/Department of Commerce authority, and include a strategy to address those influences.

The South Atlantic Fishery Management Council has developed the first regional FEP to serve as a source document of biological, economic, and social information for all FMPs and CE-BAs:

Fishery Ecosystem Plan for the South Atlantic Region (SAFMC, 2008a.) volume structure:

FEP Volume I	Introduction and Overview
FEP Volume II	South Atlantic Habitats and Species
FEP Volume III	South Atlantic Human and Institutional Environment
FEP Volume IV	Threats to South Atlantic Ecosystem and Recommendations
FEP Volume V	South Atlantic Research Programs and Data Needs
FEP Volume VI	References and Appendices

Evolution of the Habitat Plan into the FEP and transition from single species management to ecosystem-based management will require a greater understanding of the South Atlantic Bight ecosystem and the complex relationships among humans, marine life, and EFH. Over 25 workshops were held to develop the FEP. These workshops brought together Habitat and Coral Advisory Panel members and a core group of resource and habitat experts from cooperating federal, state, and academic institutions as well as conservation organizations that participated directly in development of the Habitat Plan. Updated life history and stock status information on managed species and the characteristics of the food web they exist within will be incorporated as well as social and economic research needed to fully address ecosystem-based management. Topics of workshops included wetlands, oyster/shell habitat, seagrass, pelagic habitat (including *Sargassum* and the water column), coral and live/hard bottom, artificial reefs, GIS to support EFH and ecosystem-based management, water issues affecting fishery habitat

and production, marine zoning, fishing impacts on habitat, food web modeling (Ecopath with Ecosim), and social and economic data needs. In addition, a regional workshop was held in November 2005 to identify research and monitoring needs to support ecosystem-based management in the South Atlantic. Nationally and internationally recognized experts participated and provided guidance to determine the most significant needs to be addressed in development of ecosystem-based management.

An outline for the FEP was developed and approved by the Council in June 2005. Writing Teams (composed of Advisory Panel members, experts from state and federal agencies, universities and Council staff) reviewed, updated, and expanded chapters of the Habitat Plan and developed new chapters for the FEP. Information compiled through this process will help the Council meet the mandate to update EFH and EFH-HAPC designations. This information will also help the Council meet the National Environmental Policy Act (NEPA) mandate to update Environmental Impact Statements (EIS) for all fishery management plans under Council jurisdiction.

EFH and EFH-HAPC Designations Translated to Cooperative Habitat Policy Development and Protection

The Council actively comments on non-fishing projects or policies that may impact fish habitat. Appendix A of the Comprehensive Amendment Addressing Essential Fish Habitat in Fishery Management Plans of the South Atlantic Region (SAFMC 1998b) outlines the Council's comment and policy development process and the establishment of a four-state Habitat Advisory Panel. Members of the Habitat Advisory Panel serve as the Council's habitat contacts and professionals in the field. Advisory Panel members bring projects to the Council's attention, draft comment letters, and attend public meetings. With guidance from the Advisory Panel, the Council has developed and approved policies on: energy exploration, development, transportation and hydropower re-licensing; beach dredging and filling and large-scale coastal engineering; protection and enhancement of submerged aquatic vegetation; alterations to riverine, estuarine, and nearshore flows; and marine aquaculture. In 2005, the Council's policy on energy exploration, development, and transportation was revised and updated to address impacts related to Liquefied Natural Gas (LNG) terminals and renewable energy technologies, such as wind farms. The NOAA Fisheries Service, state and federal agencies apply EFH and EFH-HAPC designations and protection policies in the day-to-day permit review process.

South Atlantic Bight Ecopath Model

The Council developed strawman and preliminary food web models (Ecopath with Ecosim) to characterize the ecological relationships of South Atlantic species, including those managed by the Council. This effort will help the Council and cooperators in identifying available information and data gaps while providing insight into ecosystem function. More importantly, the models aid in identifying research necessary to better define populations, fisheries, and their interrelationships. The model included the area between the North Carolina/Virginia border through the Florida Keys and extends from the upper wetlands to the 300-meter isobath. The preliminary model used catch data from 1995 to 2004. The Council has been coordinating with the Lenfest Ocean Program

to expand and refine the South Atlantic Ecopath with Ecosim Model to complete a fully parameterized model with development of embedded sub-models.

Cooperative Research to Support Ecosystem-Based Management

As an example of cooperative research to support EBM, the Council partnered with the National Undersea Research Center at the University of North Carolina at Wilmington (NURC/UNCW) by providing seed money to begin multi-beam sonar mapping of the outer continental shelf and upper continental slope. This region of the EEZ from just north of Cape Hatteras to Cape Canaveral, covering a depth range of 100 to 500 m, includes important habitat for current and future economically valuable species (e.g., groupers, wreckfish, crabs, tilefish, etc.). Habitats used by these species include soft bottoms of various types and a wide range of hard bottom lithotypes. This area includes important and unique features such as “The Point” canyon system (just north of Cape Hatteras, North Carolina) and the “Charleston Bump” (off of Cape Romain, South Carolina). The features of these two EFH-HAPCs result in significant oceanographic effects in the region (e.g. upwelling) and also represent productive fishery areas. Throughout the region, and toward the deeper end (350 to 450 m), are scattered but extensive deep reef systems composed of delicate, slow growing ahermatypic corals (e.g., *Lophelia*). All of these habitats are poorly mapped. In addition, the Council is establishing deepwater MPAs. High-resolution (1 to 2 m resolution) bathymetry maps are required for these areas.

1.3 Ecosystem Management Goals

The Council adopted three broad goals to support the move to EBM in the South Atlantic Region:

- Maintaining/improving ecosystem structure and function
- Maintaining/improving economic, social and cultural benefits from resources
- Maintaining/improving biological, economic and cultural diversity

2.0 Overview of the South Atlantic Ecosystem

2.1 Geographic Boundaries

For the purpose of the FEP, the South Atlantic ecosystem is the region under the jurisdiction of the Council (Figure 1) inland through the region's coastal watersheds. The South Atlantic ecosystem area intersects two Large Marine Ecosystems, and interacts with the Gulf of Mexico, and Mid Atlantic Regions and the Bahamas and Sargasso Sea (see species migrations and oceanographic characteristics presented in Section 9.3).

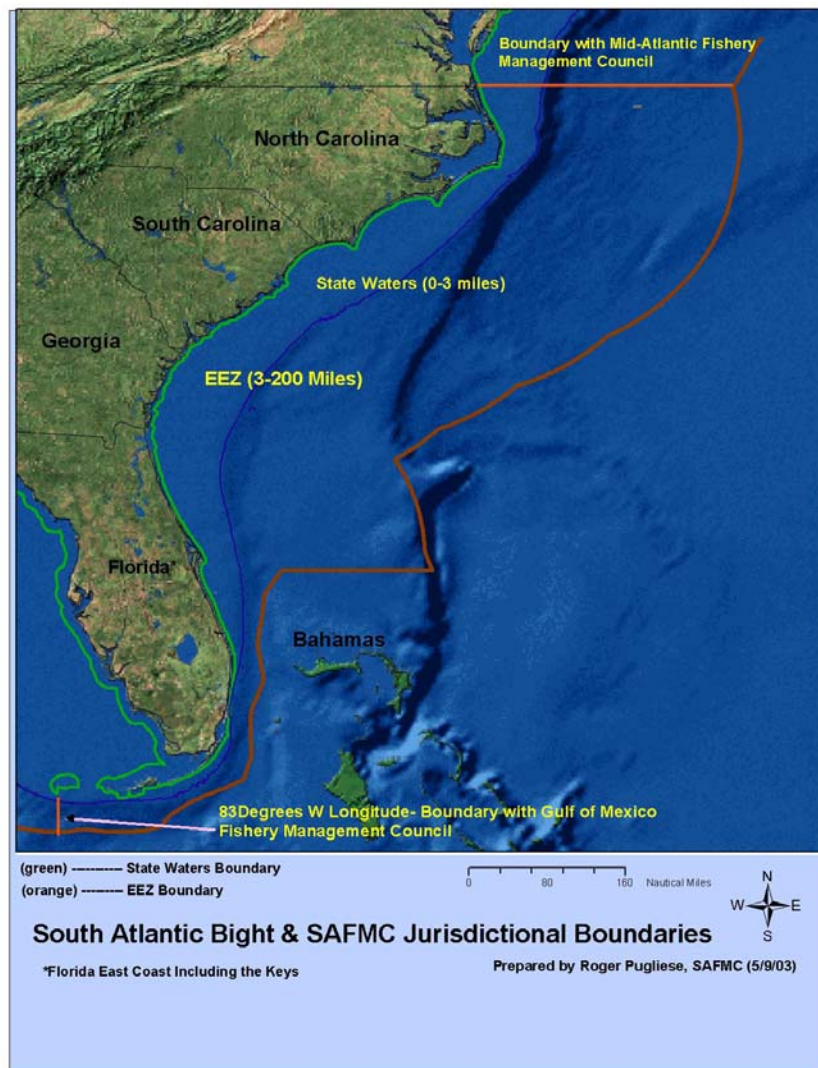


Figure 1. Jurisdictional boundaries of the South Atlantic Fishery Management Council.

2.2 Climate and weather

Section 9.3.1 Fisheries Oceanography in the South Atlantic Region summarizes the atmospheric and oceanographic characteristics of the Southeast Coastal Ocean. In Fishery Ecosystem Plan of the South Atlantic Region

addition, a detailed review of the region climate data *Monthly climatology of the continental shelf waters of the South Atlantic Bight* (B. Blanton, A. Aretxabaleta, F. Werner and H. Seim, 2003), is presented in Appendix A.

2.3 Habitat and Food Web

Volume II presents the detailed descriptions of species and habitat essential to their survival which constitute the South Atlantic food web. Volume IV presents the designations of EFH and EFH-HAPCs.

2.4 Current Area-based Approaches to Managing Fisheries in the South Atlantic

Traditional Management Practices

Traditional management practices in the South Atlantic have focused on minimum size, bag limits, trip limits, closed areas and seasons, and annual quotas. In 1998, a limited entry system was implemented for the snapper grouper fishery where landings of a minimum amount qualified individuals to remain in the fishery. These efforts were followed up with a 2-for-1 rule that required anyone buying a permit to purchase two permits and retire one of them. The goal of the 2-for-1 program was to decrease the number of permits in the fishery and thereby decrease capacity. Recent years have seen the Council explore Marine Protected Areas and Limited Access Privilege Programs as new techniques that may help them better manage the South Atlantic stocks.

Special Management Zones

Since 1983, the Council has allowed the designation of Special Management Zones (SMZs) as an incentive to create artificial reefs and fish attraction devices to increase the numbers of fish in an area and/or create fishing opportunities that would not otherwise exist. Designation of an area as an SMZ allows for gear restrictions in the area to prevent overexploitation. Many of these areas have been established through cooperation with fishing organizations and local governments and serve as a means to promote localized conservation and positive fishing experiences. A total of 51 SMZs have been designated off South Carolina, Georgia, and Florida.

Marine Protected Areas: Oculina Experimental Closed Area

The shelf-edge *Oculina* coral reef, located off the central east coast of Florida, is unique among coral reefs and exists nowhere else on earth. The area takes its name after the slow-growing, ivory-tree coral, *Oculina varicosa*, which forms massive thickets supporting dense and diverse communities of finfish and invertebrates over a 90-mile strip of reefs.

In 1984, the Council established the 92-square-mile, Oculina Bank HAPC in order to protect the fragile coral reefs. The Oculina HAPC was designed to protect the area from damage caused by bottom-tending fishing gear including bottom trawls, bottom longlines, dredges, and fish traps. Subsequent management measures provided further protection to the Oculina HAPC by prohibiting anchoring, trawling for rock shrimp and

by requiring the use of vessel monitoring systems (VMS) on rock shrimp vessels. Expanded in 2000, the HAPC now encompasses 300 square miles.

In 1994, the original 92-square-mile HAPC was declared the Oculina Experimental Closed Area and was closed to fishing for snapper/grouper species for a period of 10 years to allow for scientific studies in an area closed to fishing. Designation of an area where deepwater species, such as snowy grouper, golden tilefish, speckled hind, and Warsaw grouper, can grow and reproduce without being subjected to fishing mortality provides a unique opportunity for study. The Council took action in 2003 to extend the closure indefinitely with periodic review for further protection and research.

History of the Council's Consideration of Marine Protected Areas for the Snapper Grouper Fishery

The Snapper Grouper Fishery Management Unit (FMU) is a complex of 73 species managed by the Council under the Snapper Grouper Fishery Management Plan. The FMU is diverse and contains snappers, groupers, jacks, porgies, tilefishes, grunts, and sea basses. Seven snapper grouper species make up the “deepwater complex”: snowy grouper, misty grouper, speckled hind, yellowedge grouper, Warsaw grouper, golden tilefish, and blueline tilefish. The fishery has been under management since 1983, and the original FMP has been amended 13 times. Management measures currently in place include bag limits, size limits, gear prohibitions, seasonal closures, a commercial limited entry program, and quotas.

The potential for using Marine Protected Areas (MPAs) as a management tool for the snapper grouper fishery first originated with the Council's Snapper Grouper Plan Development Team (PDT). This technical group prepared a report (PDT 1990a) entitled “*The Potential of Marine Fishery Reserves for Reef Fish Management in the U.S. South Atlantic.*” The PDT offered this approach because they believed it was the only viable option for maintaining optimum size, age, and genetic structure of slow growing, long-lived species over the long-term. The Council received an extensive briefing on marine reserves at the February 1990 Council meeting. This provided an opportunity for the Council to discuss marine reserves as a concept and to hear about experiences with reserves in other parts of the world.

Marine reserves were initially considered as a management option in early discussions on Amendment 4 to the Snapper Grouper Fishery Management Plan, however the Council determined the reserve concept should be addressed separately and scheduled scoping meetings in each of the states. During the 1992 scoping process, support for and against the concept surfaced. The Council reviewed the scoping information during the January 1993 meeting and decided to recommend to NOAA Fisheries Service that a Scientific Review Panel be convened to review the concept of MPAs. Until that review was completed the Council chose to drop consideration of the marine reserves.

In 1995, a scientific review panel completed its review of the 1990 Snapper Grouper Plan Development Team report (NOAA 1995). The panel consisted of international experts with different experience in fishery science, marine reserves, ecology, fish genetics,

sociology, and economics. The scientific review panel concluded that properly designed marine reserves, in combination with other management measures, can be an effective management tool for reef fish resources in the U.S. South Atlantic region provided biological, ecological, social, and economic objectives of the marine reserves were clearly specified; the relative biological, ecological, and economic impacts of marine reserves in the context of other fishery management measures were estimated for various constituents; and development of marine reserve proposals proceeded with involvement of all stakeholders. Lastly, given the alarming declines in stocks of key fishery species, the panel urged that marine reserves be considered immediately as part of a comprehensive fisheries management plan to prevent irreversible loss to species and fisheries.

In further developing Snapper Grouper Amendment 8 (and later Amendment 9), the Council realized that severe impacts would be felt by fishermen if necessary percentage reductions in catches of overfished species were imposed to achieve the mandated fishery management goals. Marine reserves once again surfaced as a potential alternative to fisheries closures.

In 1998 after deciding to reconsider the possibilities of marine reserves, the Council proceeded to take steps to initiate a fact-finding process using the Marine Reserves Committee and Advisory Panel. An action plan was then developed that included three phases. During Phase I, Planning/Criteria Development, criteria were developed and questions were raised about the proper size, placement, and regulations within any potential marine reserves. During Phase II, Decision Phase, the Council, drawing on input from three rounds of scoping meetings, a marine reserves workshop, and the Marine Reserves Committee and Advisory Panel, decided that marine reserves were a necessary management tool for snapper grouper management. Phase III, Implementation, includes the Council's development of Amendment 14 to the Snapper Grouper FMP (SAFMC 2007).

When the informal meetings were held in 2000, the Council's intent was to begin a dialogue with stakeholders about the possibilities of using marine reserves as a management tool for snapper grouper species and not discuss specific management measures or specific sites. The meetings were not held by the Council, but Council members and staff made themselves available to meet with any group that made a request. Between January and March of 2000, Council members and staff attended 15 meetings including commercial fishing groups, recreational fishing groups, and conservation organizations. A total of 291 people attended these meetings. Through the informal meeting process, the Council was able to gauge public support for marine reserves and discuss all possible options for managing overfished snapper grouper species to determine whether marine reserves were a tool the Council should consider using.

During May and June 2000, the Council held another round of eight scoping meetings on marine reserves to give the public an opportunity to comment before the Council developed a position on whether or not to move forward with developing marine reserves

as a management tool. As with the informal meetings, the Council had not yet discussed specific boundary options but was ready to make a decision on the general concept of marine reserves. Stakeholders voiced many different opinions on the use of marine reserves. There was an equal amount of support and opposition for no-take marine reserves, but many different variations were offered from all sides. Many groups were in support of protecting known spawning areas from fishing and creating artificial habitats and prohibiting fishing in these areas. The Council then voted to move forward with using marine reserves.

After deciding that marine reserves were a management measure needed to help recover overfished snapper grouper species, the Council then needed to determine the appropriate locations to site marine reserves and the appropriate regulations within the boundaries. Continuing with the Council's philosophy of building support for marine reserves from the ground up, the Council looked to stakeholders to suggest where marine reserves should be placed (scoping process). In the spring of 2001, the Council held a final set of nine scoping meetings. The public were provided charts that showed known hardbottom areas off the South Atlantic coast and were asked to use their experience and knowledge of snapper grouper species (specifically deepwater snapper grouper species) to suggest areas the Council may want to consider designating as marine reserves. As a part of this scoping process, the Marine Reserves Advisory Panel was asked to also suggest areas. As a result of this process, over 40 sites were suggested and originally considered as potential marine reserves (sites not analyzed in detail and proposed as management measures in this document are listed and discussed briefly in Appendix A).

At their February 2001 meeting, the Council's Marine Reserves Committee discussed the difficulty managers and stakeholders were facing given that many different agencies were looking at marine reserves, marine sanctuaries, or marine protected areas. The different nomenclature associated with this management tool made things confusing to the public and managers. The Committee determined that the term "marine reserves" was coming to imply an area that allowed no fishing. This was contrary to the Council's intent. In order to be more consistent with national definitions, the Council adopted the term Marine Protected Areas (MPAs). As defined in Presidential Executive Order 13158, an MPA is any area of the marine environment that has been reserved by federal, state, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein. The Council further defines MPAs within its jurisdiction as a network of specific areas of marine environments reserved and managed for the primary purpose of aiding in the recovery of overfished stocks and to ensure the persistence of healthy fish stocks, fisheries, and habitats. Such areas may be over natural or artificial bottom and may include prohibition of harvest on a permanent or lesser time period to accomplish needed conservation goals.

Another aspect of the development of appropriate MPA alternatives was deciding which activities, if any, would be allowed within an MPA. The PDT report presented to the Council in 1990 suggested that these areas be set aside for non-consumptive uses. Later when the Council began seriously looking at the use of MPAs as a management tool, the Council purposely crafted a broad definition of the tool (marine reserves are specific

areas of marine environment managed for the primary purpose of aiding in the recovery of overfished stocks and to ensure the persistence of healthy fish stocks, fisheries, and habitats), which allowed the Council, its advisors, and the public to discuss and analyze the costs and benefits of allowing varying activities in the future proposed MPAs. The Council presented to the public the following alternatives for designating MPAs:

- Type 1 - Permanent closure/no-take
- Type 2 - Permanent closure/some take allowed
- Type 3 - Limited duration closure/no-take
- Type 4 - Limited duration closure/some take allowed

Ultimately, the Council narrowed its focus for this round of MPAs and determined the greatest need for this management tool at this time was to protect deepwater snapper grouper species. After that decision was made, the Council determined that both the social and economic costs of prohibiting all fishing were greater than the benefits (more effective law enforcement). The majority of the proposed MPAs (designed to protect deepwater snapper grouper species) are also popular trolling spots for the pelagic fisheries. Therefore, the Council choose to move forward with designating the proposed MPAs as Type 2 MPAs where the harvest and possession of snapper species would be prohibited within their borders (however, the prohibition on possession does not apply to a person aboard a vessel that is in transit with fishing gear appropriately stowed as defined in Appendix F).

Considerations for Type 1 vs. Type 2 Marine Protected Areas

Benthic-pelagic linkages

The net ecological effect of allowing fishing for pelagic species (e.g., billfish, tunas, dolphin, wahoo, and others) in a Type 2 MPA designated to protect deepwater snapper grouper species (e.g., snowy grouper, tilefish, queen snapper, and others) is anticipated to be minimal for two reasons. First, there may not be a strong ecological link between pelagic species and benthic top predators in the proposed Type 2 MPAs, as those fish in one depth stratum rarely consume fish from another (Wahle et al. 2006). Deepwater snapper grouper species are generally found less than two meters from the substrate. Pelagic species are usually found in the top 30 meters of the water column and their interaction with benthic species is minimal. While there may not be a direct, strong ecological link between pelagic species and deepwater snapper grouper, food web models indicate there are trophic relationships between the two groups (Weaver and Sedberry 2005).

Furthermore, some pelagic species, such as greater amberjack, occur throughout the water column, including the benthos and are taken with trolling and bottom tending gear. Greater amberjack have been collected in many of the proposed Type 2 MPAs and have been observed on the bottom from a submersible in several of the proposed Type 2 MPAs (Sedberry et al. 2005). While greater amberjack is not a direct predator of deepwater snapper grouper species, it probably shares food resources. There is also evidence other pelagic species, such as swordfish, bluefin tuna, yellowfin tuna, and various shark species, follow isolumes and occur in deepwater during daylight hours; however, these species are usually found offshore of the proposed Type 2 MPAs (Brill and Lutcavage

2001; Loefer et al. 2005). Although there is some trophic interaction, pelagic species and deepwater snapper grouper species generally take advantage of spatially distinct food and habitat resources and usually remain in close proximity to their set of resource needs.

Pelagic species such as marlins and tunas are not likely to be strongly affected by the proposed Type 2 MPAs because these species may swim in and out of the small protected areas frequently and would continue to be vulnerable to fishing outside of the closed area. Any impacts pelagic species such as marlins and tunas may indirectly have on the deepwater snapper grouper species is therefore unlikely to be affected by the establishment of the proposed Type 2 MPAs, even if fishing for the former were still allowed in the closed area (Wahle et al. 2006).

Bycatch of snapper grouper species in a fishery for pelagic species

Pelagic species are generally captured by trolling (i.e., towing artificial or live bait behind the wake of a vessel) at depths of 10 to 30 meters from the surface (Everhart and Youngs 1981). The proposed Type 2 MPAs are at depths ranging from 60 to 700 meters. However, methods used to troll for coastal migratory pelagics can access deep reef fishes. NOAA Fisheries Service researchers used a variety of gear types and techniques to assess the susceptibility of reef fish to trolling using downriggers at 200 to 400 feet in the Madison-Swanson MPA in the Gulf of Mexico (David 2003). Reef fish (gag, speckled hind, red snapper, Warsaw grouper, scamp, and greater amberjack) were captured at a rate of one fish every 100 minutes. Therefore, a Type 2 MPA where fishing for non-snapper grouper pelagic species is allowed could result in bycatch of snapper grouper species, including some deepwater species targeted for protection in this amendment.

Problems with enforcement of the proposed Type 2 MPAs

The main enforcement concern with the proposed MPAs is their Type 2 status. When no fishing is allowed in an area (as in a Type 1 MPA or marine reserve), and a vessel monitoring system (VMS) shows a vessel has been in the closed area, enforcement can potentially use this information along with other information to determine whether a violation has occurred. However, in a Type 2 MPA where some fishing is allowed, it is more difficult to determine whether a violation has occurred. In this situation, the only purpose served by VMS is to alert the agent that someone is in the area, not to document wrongdoing. Because the proposed MPAs are far offshore, the transit time required from when law enforcement learns someone is in an MPA to when law enforcement arrives at the site in question may be substantial, and the violator may be gone before enforcement is able to respond to a potential violation.

During 2001 and into 2002 the Council, with help from its advisors, began working to determine which of the 40 sites suggested through scoping would best meet the Council's management objective to protect deepwater snapper grouper species. In August of 2001 the Council held an unprecedented "Mega-AP" meeting of the Habitat, Coral, Snapper Grouper, MPA, Law Enforcement, and Wreckfish Advisory Panels. The Advisory Panels were asked to help the Council select sites that would be the most beneficial to the overfished, deepwater snapper grouper species using their various and vast knowledge,

understanding that the Council's intent was to look at sites that protect more inshore snapper grouper species further down the line.

Later in 2001 the Snapper Grouper Assessment Group, the Scientific and Statistical Committee (SSC), and the Snapper Grouper Advisory Panel met with the Council's Snapper Grouper Committee to provide additional input on the possible MPA sites. Based on input from the SSC, Advisory Panels, and the Snapper Grouper Committee, the Council then instructed staff to develop an options paper for Snapper Grouper Amendment 14 with an initial level of analysis of sites the Council felt met the criteria of protecting overfished, deepwater snapper grouper species.

The sites that met the criteria of protecting overfished, deepwater snapper grouper species were included in the Informational Public Hearing Document and taken out to public hearings in early 2004. At those public hearings social and economic data were collected to help staff refine sites and analyze the impacts of the proposed sites. The information gathered at the informational public hearings helped staff assess the social and economic impacts of each individual site and is summarized under the discussion of each management measure in Section 4.

The Council produced a source document that includes much of the material prepared during development and consideration of MPA (SAFMC 2005). This material is available on the Council's website.

Considerations for MPA Design

There is a large body of literature regarding designs of marine reserves and MPAs. Specific design considerations are summarized in the report of the Plan Development Team (1990). Questions about the proper size, placement, and regulations for potential reserves were considered by the Scientific Review Panel convened by NOAA in 1990 to review the concept of MPAs, and by the Council's Marine Reserves Committee and Advisory Panel in writing their Action Plan in 1998. The Council has focused on the presence of deepwater snapper grouper species and their habitat as the primary biological criteria for a deepwater Type 2 MPA.

While biological considerations alone may suggest certain MPA design characteristics, the social and economic impacts of MPAs on fishing communities must also be taken into consideration, for two reasons. First, National Standard 8 of the Magnuson-Stevens Act requires the Council to "take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities." Second, research shows "a fundamental lesson learned from experience throughout the world is that attempts to implement MPAs in the absence of general community support invariably fail. Inclusion of "bottom-up" or "grass-roots" approaches to planning, design, and implementation of MPAs offers the best opportunity to develop plans with the endorsement of local communities (NRC 2001)." This type of "bottom-up" approach has been the goal of the Council since the outset of their deliberations on MPAs in the South Atlantic, and its implementation has allowed them to

successfully balance biological considerations with public concerns when determining the characteristics of their proposed MPAs.

Due to the complex nature of ecosystems and the limitations of traditional fisheries management methods, fisheries management may benefit from multiple management components as part of an overall plan. The Type 2 MPAs are intended to augment, not replace, existing management. Lauck et al. (1998) suggests “. . . MPAs can serve to hedge against inevitable uncertainties, errors, and biases in fisheries management.” The Type 2 MPAs are expected to perform this function, among others, for the management of deepwater snapper grouper species in the South Atlantic.

Rights-based systems

Excerpted from: *Use of Property Rights Systems in Fisheries Management* - R. Shotton, FAO (1999)

Property Rights in fisheries, and elsewhere, are often defined as a ‘bundle of attributes’ and exist as a continuum in terms of their characteristics. Scott (1996) refers to the most important of these as: a) transferability, b) exclusivity, c) security and d) durability.

These four conceptual elements provide a basis for looking at the characteristics of existing fisheries property rights systems. These attributes are mediated, or conditioned, by the need to manage the fishery. Transferability requires ownership registries plus the rules and means to make them function; exclusivity requires monitoring and enforcement systems; and security of title requires an effective and honest legal system; durable rights are those that the possessor holds for a long time, perhaps in perpetuity. Many of these management needs may exist, irrespective of whether the fishery is considered to have weak or strong property rights.

The strongest fisheries property rights systems will be those in which Scott’s (1996) characteristics are the least constrained, and by looking at how different national and regional management regimes have developed and, or, constrained these attributes, an understanding of the development of ‘strong’ property-rights fisheries systems can be gained.

In many areas of the world, there exist property rights systems in fisheries that depend on unwritten, traditional, or customary agreements about who may fish in a particular location, and sometimes, what type of gear they are allowed to use (e.g. Foale 1996). While unwritten, these rights may be well accepted and fiercely enforced and be just as effective in achieving their objectives as those that have been legislated into existence. In these situations, social, or cultural, traditions will determine the nature of the property rights in terms of the criteria mentioned above.

Depending on which criterion is to be given greatest weight, property rights systems in fisheries may be structured as follows:

“Individual” Transferable Harvest Quotas

These are commonly called ITQs - the famous, or perhaps infamous term, which is now well known if not so commonly understood. Various terms have been used to describe these depending on the circumstances of their application and some writers use the term ITQ in a general sense. For example, ICES 1997 in their characterization of ITQs uses the term ‘Individual’ to include when rights are held by a person, a vessel, a community, an enterprise, or some other form of collective. They assume that the ‘quota’ can be either an output unit - tons caught - or an input unit - the amount of fishing gear that can be used. Non-transferable quota management systems are commonly termed (Individual Quota) IQ systems.

ITQs may be stinted in various ways and to various degrees. If the harvest right is attached to a fishing boat, they may be referred to as IFQs - Individual Fishing Quotas, but in other ways they may have no operational differences to an ITQ (See e.g. Grafton 1996, for a detailed review on their conceptual characteristics).

Community Quota

Community quotas may share most of the characteristics of ITQs except that there are additional constraints on who may own them - this may be perceived as a constraint on their transferability - they cannot be sold (or even leased) to someone who is not a member of the community. The existence of a community quota may have a legal basis: in this case a condition attached to the quota may be that it legally must remain ‘in’ the community. However, municipalities, for example, may buy quota in the market as other quota holders do and then lease them to fishermen they deem to be part of their community, as is the case in the Shetland Islands.

Another issue relates to how the community is defined. Conventionally, communities have a geographical context, but in some management regions, a different approach has been adopted. In these, a community has been taken to mean a collection of people with similar interests, now often referred to in a fisheries management context as a virtual community. In the Maritime Region of Canada for example, two of nine communities that have been awarded quota to manage themselves are defined in terms of the type of fishing gear they use.

Territorial User Fisheries Rights

Conventionally called TURFs, these convey to the ‘owners’ some fishing rights to a specific area. There is no reason why they need not have all the attributes of for example an ITQ system, except the right is to undertake fishing in a defined area, rather than remove an amount of fish. The rights may be transferable and of variable durability, exclusivity, etc. Christy (1982) and Panayotou (1984) provide further details.

Fishing Input Rights

These may be exactly analogous in the sense of their property-rights attributes to ITQs, except that the right relates to the amount of fishing gear that can be used. A particularly well known example is the Western Australia lobster fishery where the unit of ownership is an individual lobster trap. Another Australian example is found in the Northern Prawn

Fishery. Originally, when input control was introduced into this fishery, the measure of vessel capacity used was based on vessel gross registered tonnage and engine power. This input unit subsequently changed to a unit length (one foot - 12 inches) of the shrimp trawl ground rope because the vessels started towing four trawls rather than just two.

Resource management may be the most important functional attribute relating to fisheries property rights systems. With few exceptions, the total desirable catch in terms of obtaining the maximum benefits from the fishery will change from year to year, either to avoid growth overfishing or because of an expectation of excessive declines in recruitment. In this case the stock may fall below some minimum biological acceptable level unless fishing mortality is reduced. In output, i.e. quota controlled fisheries, the amount of fish a rights holder is entitled to remove is usually defined as a percentage of the total allowable catch. Thus the rights holder's absolute catch each year will vary as does the total allowable catch (TAC). How the TAC is determined is usually independent of the type of rights system used in the fishery (though in rights-based fisheries management systems the quota holders are often formally involved in the TAC-setting process). Thus, monitoring and enforcement is necessary to ensure quotas are not exceeded, as in any fishery where catch is limited.

In input-controlled fisheries, adjustments are required to the amount of effort that is exerted to control fishing mortality. In the case of trap fisheries this may mean adjusting the number of traps by removal of a percentage of the traps that are fished (though varying the length of fishing seasons remains an option). In the case of a ground-rope rights-based fishery, e.g. the Australian Northern Prawn Fishery, fishermen may be required to forfeit a percentage of their foot-rope length entitlements if the TAC is to be reduced. This in turn requires that they either purchase the difference from other rights holders to maintain their level of effort in the fishery, or they become unable to participate.

The South Atlantic Wreckfish ITQ Program

Prior to implementation of the Wreckfish ITQ, a classic fishing derby had evolved where approximately 80 vessels were in competition for the 2 million pound quota. A substantial number of vessels added wreckfish reels to catch fish faster, thereby garnering more of the available TAC, while others began to use bottom longline gear to catch wreckfish more rapidly, despite reportedly significant gear conflicts and losses using bottom longlines.

As the pace of wreckfish landings increased in 1990, ex-vessel prices decreased substantially. The fact that as many as 80 vessels were fishing for wreckfish on the relatively small rock ridge areas known to have concentrations of wreckfish created a potential for conflicts among harvesters and vessel safety problems.

Although still one of the most profitable fishing opportunities in the southeast in 1990, the wreckfish fishery had already begun to show signs of excess capacity and over-capitalization by the end of the year. Public comment stressed the detrimental effects of continued entry and competitive fishing practices under a restrictive TAC. Along with

the economic problems of overcapitalization and excess capacity common to open access fisheries managed by TAC, public comment stressed the absence of conservation incentives and probably lack of regulatory compliance in the fishery. Comments from wreckfish dealers pointed to the tendency for markets to become flooded as the pace of wreckfish harvest increased beyond their ability to move the product through the market chain. Other marketing problems resulting from inconsistent supply when TAC was met were also identified.

Amendment 3 had been developed to add wreckfish to the Snapper Grouper management unit, define an optimum yield for wreckfish, establish a control date, and, among other things, identify a TAC for the wreckfish resource. The Wreckfish ITQ (Amendment 5) was implemented in March 1992. The overall goal of implementing the South Atlantic Wreckfish ITQ was to “manage the wreckfish sector of the snapper-grouper fishery so that its long-term economic viability will be preserved.” Other objectives and stated in Amendment 5 included:

- Develop a mechanism to vest fishermen in the wreckfish fishery and create incentives for conservation and regulatory compliance whereby fishermen can realize potential long-run benefits from efforts to conserve and manage the wreckfish resource.
- Provide a management regime which promotes stability and facilitates long-range planning and investment by harvesters and fish dealers while avoiding, where possible, the necessity for more stringent management measures and increasing management costs over time.
- Develop a mechanism that allows the marketplace to drive harvest strategies and product forms in order to maintain product continuity and increase total producer and consumer benefits from the fishery.
- Promote management regimes that minimize gear and area conflicts among fishermen.
- Minimize the tendency for overcapitalization in the harvesting and processing/distribution sectors.
- Provide a reasonable opportunity for fishermen to make adequate returns from commercial fishing by controlling entry so that returns are not regularly dissipated by open access, while also providing avenues for fishermen not initially included in the limited entry program to enter the program.

Although not an explicit objective, the Council believed that portions or all of management and administrative costs should be recovered from those who held individual quota shares in the wreckfish fishery.

Eligibility for participation required that an applicant needed to own a vessel or vessels that landed at least 5000 pounds (dressed weight) of wreckfish in aggregate between 1987 and September 1990. Initial allocations were made such that 50 of the 100 available shares were divided equally among eligible participants. The remaining 50 shares were divided based on an applicants documented historical catch divided by the total catch of all eligible participants over the same period. Documented historical catch was calculated based on landings of wreckfish made between January 1989 and September 1990 when a control date was issued.

For approximately one month after initial allocation, an Application Oversight Committee considered requests from persons wishing to contest the initial allocations. The Committee was empowered to consider only allegations of improper calculations or improper determinations based on documentation submitted with application. Hardship circumstances were not considered.

Following initial allocation, coupons were distributed representing shares. Coupons could be sold, leased, or loaned, but only to a person who holds a percentage share in the wreckfish fishery. Fishermen were required to possess a wreckfish vessel permit, logbook, and ITQ coupons equaling the approximate weight of catch in their possession. The coupons had to be signed and dated by the time of landing. Penalties for significant violations included forfeitures of shares, forfeitures of individual quotas, and/or vessel or dealer permit sanctions.

Dealers were required to obtain a Federal wreckfish dealer's permit. The requirements to obtain a dealer's permit were a state wholesaler's permit and a physical facility at a fixed location in the state where the wholesaler's permit is held.

Limited Access Privilege Program (LAPP) for the Snapper Grouper Fishery

Since the original Snapper Grouper Fishery Management Plan was implemented over 2 decades ago, the fishery has seen many changes. Population increases along the South Atlantic coast have contributed to loss of habitat and increased fishing pressure. Economically, seafood imports have driven domestic market prices downward while waterfront property prices have skyrocketed, limiting waterfront accessibility. Meanwhile, management requirements have led to a litany of complex regulations, including size and bag limits, trip limits, and seasonal closures to protect stocks from overfishing or becoming overfished.

These and other factors have decreased the ability of fishermen to maintain profitability in the South Atlantic snapper grouper fishery. Management options that enable fishermen increased flexibility may help increase individual profitability - and options that enable a reduction in fleet size while maintaining status quo landings are expected to increase total fleet profitability. Any new management tool considered for the fishery will need to support maintenance of landings within the commercial quota and minimize discarded fish. With these goals in mind, the Council is considering creating a LAPP for the commercial snapper grouper fishery.

The recently reauthorized Magnuson-Stevens Act (2006), the primary legislation outlining national fishery policy, contains language supporting creation of LAPPs for fisheries and provides specific guidelines and requirements for implementation of such programs.

For several years, the Council and Controlled Access Committee have received presentations from academics, Council staff, and NOAA Fisheries Service regarding the use of IFQs in various fisheries of the U.S. and other countries. In December, 2006, the

Council approved a motion to consider application of a LAPP for the South Atlantic snapper grouper fishery.

The Controlled Access Committee met January 23-24, 2007 to begin development of an action plan to outline how the Council might go about exploring the use of LAPP for the commercial snapper grouper fishery. The Committee also developed recommendations for the structure and membership of a LAPP Exploratory Workgroup to aid in this process.

In March 2007 the Controlled Access Committee, now called the Limited Access Privilege Program Committee, met during the Council meeting to finalize membership to a LAPP Exploratory Workgroup. The Council approved the Workgroup membership and the Action Plan for LAPP consideration. The Workgroup was composed of fishery stakeholders including fishermen from each gear group (longline, hook and line, dive) and state, fish house owners, an environmental representative, Sea Grant staff, and NMFS staff. The Workgroup met nine times and compiled a report on the appropriateness of LAPPs for the South Atlantic commercial snapper grouper fishery and what characteristics the Workgroup thought a LAPP should have. The Workgroup also expressed the possible positive and negative impacts they could foresee of a LAPP, prerequisites for a LAPP, and goals and objectives for a LAPP. These were incorporated into the document. The document also contains background information on various aspects of a LAPP.

In early March 2008, the South Atlantic Fishery Management Council received the LAPP Exploratory Workgroup's Final Report and discussed whether to move ahead with development of an amendment that would explore the potential impacts of an LAP for the commercial snapper grouper fishery. The Council decided not to move ahead with development of an amendment at this time. However, the Council directed Council staff to contact tilefish fishermen to ask about their interest in a possible LAPP for the tilefish fishery. In June 2008, the Council decided to develop a Golden Tilefish LAP Program Exploratory Workgroup to design a LAP for the golden tilefish fishery and provide advice to the Council on this management consideration.

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SAFMC Fishery Management Plans and other documents

Snapper Grouper FMP and Amendments
Shrimp FMP and Amendments
Coral, Coral Reefs and Live/Hard Bottom Habitat FMP and Amendments
Spiny Lobster FMP and Amendments
Sargassum FMP
Dolphin Wahoo FMP
Coastal Migratory Pelagics FMP and Amendments
Golden Crab FMP and Amendments
Red Drum FMP and Source Document

Potential Fishing Communities in the Carolinas, Georgia and Florida: An effort in baseline profiling and mapping

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