PUBLIC HEARING DRAFT

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

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ABBREVIATIONS AND ACRONYMS

ABC	Allowable Biological Catch
ALS	Accumulative Landings System
ACCSP	Atlantic Coastal Cooperative Statistics Program
B	A measure of fish biomass either in weight or other appropriate unit
BMSY	The biomass of fish expected to exist under equilibrium conditions when fishing at FMSY
BOY	The biomass of fish expected to exist under equilibrium conditions when fishing at FOY
BCURR	The current biomass of fish
C	Catch expressed as average landings over some appropriate period
DSEIS	Draft Supplemental Environmental Impact Statement
EFH	Essential Fish Habitat
EFH-HAPC	Essential Fish Habitat - Habitat Area of Particular Concern
EIS	Environmental Impact Statement
ESA	Endangered Species Act of 1973
F	A measure of the instantaneous rate of fishing mortality
FCURR	The current instantaneous rate of fishing mortality
FMSY	The rate of fishing mortality expected to achieve MSY under equilibrium conditions and a corresponding biomass of BMSY
FOY	The rate of fishing mortality expected to achieve OY under equilibrium conditions and a corresponding biomass of BOY
FEIS	Final Environmental Impact Statement
FMU	Fishery Management Unit
MARMAP	Marine Resources Monitoring Assessment and Prediction Program
MFMT	Maximum Fishing Mortality Threshold
MMPA	Marine Mammal Protection Act of 1972
MRFSS	Marine Recreation Fisheries Statistics Survey
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MSST	Minimum Stock Size Threshold
MSY	Maximum Sustainable Yield
NEPA	National Environmental Policy Act of 1969
OY	Optimum Yield
RIR	Regulatory Impact Review
SEDAR	Southeast Data, Assessment and Review
SFA	Sustainable Fisheries Act
SIA	Social Impact Assessment
SPR	Spawning Potential Ratio
SSR	Spawning (biomass) per Recruit
TMIN	The length of time in which a stock could be rebuilt in the absence of fishing mortality on that stock
TAC	Total Allowable Catch

Glossary

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Introduction

1.0 Background Supporting Move to Ecosystem Based Management

The development of a South Atlantic Council Fishery Ecosystem Plan (FEP) (SAFMC, 2007) provides the first regional opportunity to compile and review available habitat, biological, social, and economic fishery and resource information for fisheries in the South Atlantic Bight ecosystem in context. Development of the plan expands and significantly updates the SAFMC Habitat Plan (SAFMC, 1998) incorporating comprehensive details of all managed species (SAFMC, South Atlantic States, ASMFC, and NOAA Fisheries Highly Migratory Species and Protected Species) including their biology and food web, and economic and social characteristics of the fisheries prosecuted in those resources. In addition, development of the FEP has initiated coordination and integration of information from other developing regional initiatives including but not limited to the Southeast Coastal Ocean Observing Regional Association (SECOORA) and the Southeast Aquatic Resources Partnership (SARP) under the National Habitat Action Plan. The FEP development process has provided the Council with the opportunity to build on the existing comprehensive compendium of the habitat, fisheries, and ecosystem information in the South Atlantic Council's Habitat Plan. This effort has resulted in the development of a FEP that describes the South Atlantic Ecosystem and the impact of the fisheries on the environment. The FEP also updates available information on designated Essential Fish Habitat (EFH) and EFH-Habitat Areas of Particular Concern, expands descriptions of biology and status of managed species, presents ecosystem considerations for managed species, and describes the social and economic characteristics of the fisheries in the region. In addition, it expands the discussion and description of existing comprehensive habitat research needs to include all biological, social, and economic research needed to fully address ecosystem-based management. This FEP serves as a living source document of biological, economic, and social information for all Fishery Management Plans (FMP). All future Environmental Assessments and Environmental Impact Statements would be developed through subsequent amendments to those FMPs.

Fishery Ecosystem Plan for the South Atlantic Region encompasses the following volume structure:

FEP Volume I	Introduction and Overview of FEP for the South Atlantic Region
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

This first Comprehensive Ecosystem Amendment (CEA) is being supported by this FEP and updates EFH and EFH-HAPC information and addresses the Final EFH Rule (e.g., GIS presented for all EFH and EFH-HAPCs). Management actions proposed in the CEA propose the establishment of deepwater Coral HAPCs to protect what is thought to be the

largest continuous distribution (>23,000 square miles) of pristine, untouched, deepwater coral ecosystems in the world.

The SAFMC 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 SAFMC'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. The Council has endorsed the Panels' recommendation for designation of new deepwater Coral Habitat Areas of Particular Concern under the Federal Coral FMP. New deepwater coral HAPCs will be designated through the Fishery Ecosystem Plan Comprehensive Amendment.

The CEA development process serves as the vehicle to move the Council to a new era of ecosystem-based management. While this first CEA focuses on deepwater coral ecosystem conservation and EFH related action, future FMP actions will be addressed by having a full review of management needs to initiate preparation of a new CEA to address all FMP amendment needs in the coming year. This effort will not only draw from and build on the biological, economic, and social information presented in the FEP, but will also address possible issues or future management actions identified in the FEP. This process will provide the Council with the opportunity to evaluate needed actions across multiple fisheries, evaluate the impacts of management, and facilitate development of individual FMP amendments or measures that could apply across FMPs.

While this iteration of the CEA has been focused on addressing immediate needs for deepwater coral conservation, the Council acknowledges the combined development of the FEP and CEA establishes a process to facilitate the transition from single species to ecosystem based management. The following highlights how the Council is addressing directives from guidance documents supporting ecosystem-based management:

Council Activities Addressing Ocean Commission Report and Pew Guiding Principles and Recommendations

<u>Guiding Principles in the Ocean Commission Report</u>:

- **Sustainability** – *the Council's goal is to conserve and manage South Atlantic fishery resources*

- **Stewardship** – *the Council strives to balance different uses of fishery resources in the South Atlantic EEZ*

- **Ocean-Land-Atmosphere Connections –** *the Council is actively engaged in partnerships that aim to characterize these connections (Ocean Observing Systems) in order to integrate them into management*

- **Ecosystem-based Management –** *the Council has been working with partners since 2002 to develop the Fishery Ecosystem Plan and Comprehensive Ecosystem Amendment*

- **Multiple Use Management** -- *the Council uses diverse management strategies to ensure sustainability of regional resources*

- **Preservation of Marine Biodiversity**— *examples of action 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** —*SEDAR and SSC*

- **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 Related to EAM in OC and Pew Reports

- **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 undergone 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 (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, golden crab, and rock shrimp in the EEZ and is evaluating expanding the limited entry program for the snapper grouper fishery to a full Limited Access Privilege Program (LAPP)*

- **Maximize the Use of VMS for Fishery-Related Activities –** *the Council requires VMS on rock shrimp vessels and will be evaluating requiring VMS on all commercial and some recreational vessels*

- **Expand EFH designations –** *the Council is exploring available analytical methods to refine and expand EFH designations*

- **Address Environmental Impacts of Aquaculture –** *the Council recently approved a Policy Statement on Marine Aquaculture developed through its Habitat AP*

- **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 APs*

- **Regulate Destructive Fishing Gear –** *the Council already has regulations in place to protect habitat from destructive fishing gear; for example*
    - *prohibition on use of fish traps, trawls, and entanglement nets in the snapper grouper fishery*
    - *prohibition on use of longlines shallower than 50 fathoms*

- **Reduce Bycatch –** *the Council strongly supports the continued implementation of ACCSP to have better access to bycatch data to inform management decisions*
    - *BRDs are required in penaeid and rock shrimp fisheries*
    - *prohibition on use of fish traps, trawls and entanglement nets in the snapper grouper fishery*
    - *prohibition on the use of drift gill nets in the coastal migratory pelagic fishery*

- **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 is a member of the SECOORA Steering Committee and is facilitating expanding the 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, an Internet Mapping System to support the move to an EAM and disseminate data and information to a broad user body*

- Concern.

1.1 Habitat protection and ecosystem management responsibilities as defined in the Magnuson-Stevens Fishery Conservation and Management Act

Essential Fish Habitat and Essential Fish Habitat Areas of Particular Concern

EFH is defined in the Magnuson Stevens Conservation and Management Act of 1976 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.

Essential fish habitat is defined in the Act as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The definition for EFH may include habitat for an individual species or an assemblage of species, whichever is appropriate within each FMP. For the purpose of interpreting the definition of essential fish habitat: "waters" includes aquatic areas and their associated physical, chemical, and biological properties that are utilized by fish. When appropriate this may include areas used historically. Water quality, including but not limited to nutrient levels, oxygen concentration and turbidity levels is also considered to be a component of this definition. Examples of "waters" that may be considered EFH, include open waters, wetlands, estuarine habitats, riverine habitats, and wetlands hydologically connected to productive water bodies.

"Necessary", relative to the definition of essential fish habitat, means the habitat required to support a sustainable fishery and a healthy ecosystem, while "spawning, breeding, feeding, or growth to maturity" covers a species full life cycle. In the context of this definition the term "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. Included in the interpretation of "substrate" are artificial reefs and shipwrecks (if providing EFH), and partially or entirely submerged structures such as jetties.

The National Marine Fisheries Service assists Councils in implementing EFH by assessing the quality of available data in a four-level system:

Level 1: species distribution data for all or part of its geographic range
Level 2: data on habitat-related densities or relative abundance of the species
Level 3: data on growth, reproduction and survival rates within habitats
Level 4: production rates by habitat

In addition to EFH the Councils must identify EFH - Habitat Areas of Particular Concern (HAPCs) within EFH. In determining which areas should be designated as HAPCs the area must meet one or more of the following criteria:

Ecological function provided by the habitat is important
Habitat is sensitive to human-induced environmental degradation
Development activities are or will be stressing the habitat type
Habitat type is rare

Introduction

This section presents a summary of Council habitat responsibilities pursuant to the Magnuson-Stevens Act and the approved designations of EFH and EFH-HAPCs for Council managed species.

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

The Magnuson-Stevens Fishery Conservation and Management Act, Public Law 104-208 reflects the new Secretary of Commerce and Fishery Management Council authority and responsibilities for the protection of essential fishery habitat. Section 305 (b) Fish Habitat, indicates the Secretary (through NMFS) shall, within 6 months of the date of enactment of the Sustainable Fisheries Act, establish by regulation guidelines to assist the Councils in the description and identification of essential fish habitat in fishery management plans (including adverse impacts on such habitat) and in the consideration of actions to ensure the conservation and enhancement of such habitat. In addition, the Secretary (through NMFS) shall: set forth a schedule for the amendment of fishery management plans to include the identification of essential fish habitat and for the review and updating of such identifications based on new scientific evidence or other relevant information; in consultation with participants in the fishery, shall provide each Council with recommendations and information regarding each fishery under that Council's authority to assist it in the identification of essential fish habitat, the adverse impacts on that habitat, and the actions that should be considered to ensure the conservation and enhancement of that habitat; review programs administered by the Department of Commerce and ensure that any relevant programs further the conservation and enhancement of essential fish habitat; and the Secretary shall coordinate with and provide information to other Federal agencies to further the conservation and enhancement of essential fish habitat.

The 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 any essential fish habitat identified under this Act. Additional provisions specify that each Council: 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; and 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 any essential fish habitat identified under this Act, the Secretary shall recommend to such agency measures that can be taken by such agency 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 Habitat Plan (SAFMC 1998a).

On December 19, 1997, an interim final rule was published in the Federal Register to implement the essential fish habitat (EFH) provisions of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). This rule establishes guidelines to assist the Regional Fishery Management Councils (Councils) and the Secretary of Commerce (Secretary) in the description and identification of EFH in fishery management plans (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 regulations also detailed procedures the Secretary (acting through NMFS), other Federal agencies, state agencies, and the Councils will use to coordinate, consult, or provide recommendations on Federal and state activities that may adversely affect EFH. The intended effect of the rule was to promote the protection, conservation, and enhancement of EFH. On January 17, 2002, the Final Rule for EFH was published with an effective date of February 19, 2002. This rule supersedes the interim final rule with the main changes being in the procedures for consultation, coordination and recommendations on permit activities and guidelines for EFH information in FMPs. The final rule provides clearer guidelines for prioritizing and analyzing habitat effects for managed species. The rule retains the four tiered level for data division applied in identifying EFH. The rule provides more flexibility in designating EFH when information

is limited and allows Councils to use available distribution information as well as presence absence data. It also allows informed decision based on similar species and other life stages.

Essential fish habitat is defined in the Act as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The definition for EFH may include habitat for an individual species or an assemblage of species, whichever is appropriate within each FMP.

For the purpose of interpreting the definition of essential fish habitat: "waters" includes aquatic areas and their associated physical, chemical, and biological properties that are utilized by fish. When appropriate this may include areas used historically. Water quality, including but not limited to nutrient levels, oxygen concentration and turbidity levels is also considered to be a component of this definition. Examples of "waters" that may be considered EFH, include open waters, wetlands, estuarine habitats, riverine habitats, and wetlands hydologically connected to productive water bodies.

"Necessary", relative to the definition of essential fish habitat, means the habitat required to support a sustainable fishery and a healthy ecosystem, while "spawning, breeding, feeding, or growth to maturity" covers a species full life cycle.
In the context of this definition the term "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. Included in the interpretation of "substrate" are artificial reefs and shipwrecks (if providing EFH), and partially or entirely submerged structures such as jetties.

The Fishery Ecosystem Plan (SAFMC 2007) updates EFH information in the Habitat Plan (SAFMC 1998a) and presents refined information on habitat requirements (by life stage where information exists) for species managed by the Council. Available information on environmental and habitat variables that control or limit distribution, abundance, reproduction, growth, survival, and productivity of the managed species is included.

The Council, in working with our Habitat and Coral Advisory Panels and through a series of workshops identified available environmental and fisheries data sources relevant to the managed species that would be useful in describing and identifying EFH. In addition, the EFH workshop process tapped in on habitat experts, at the State, Federal, and regional level, to participate in the description and identification of EFH in the South Atlantic region.

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 of managed species. The Council used the best scientific information available to describe and identify 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.

Based on the ecological relationships of species and relationships between species and their habitat the Council took an ecosystem approach in designating EFH in the Habitat Plan and Comprehensive Amendment and in refining the information presented in the FEP (SAFMC in prep) for managed species and species assemblages. This approach is consistent with NMFS guidelines and broader goals for ecosystem management. Through the existing habitat policy, the Council directs the protection of essential fish habitat types and the enhancement and restoration of their quality and quantity.

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 Internet Map Server http://ocean.floridamarine.org/efh_coral/ims/viewer.htm and geographic information system (GIS). Maps developed to date by Council staff, Florida Marine Research Institute, NMFS Southeast Fisheries Science Center, NOAA, North Carolina DNR, SCDNR, and FWRI encompass appropriate temporal and spatial variability in presenting the distribution of EFH. Where information exists, seasonal changes are represented in the maps. EFH is identified on maps along with areas used by different life history stages of the species. The maps present the various habitat types described as EFH.
The Habitat Plan (SAFMC 1998a) and Volume IV of the Fishery Ecosystem Plan present information on adverse effects from fishing and describes management measures the Council has implemented to minimize adverse effects on EFH from fishing. The conservation and enhancement measures implemented by the Council to date 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 their habitat, 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 NMFS by Auster and Langton (1998) that 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 in the south Atlantic EEZ.

The Council is considering evidence that some fishing practices may have an identifiable adverse effect on habitat, and are addressing those pertaining to deepwater coral ecosystems in this first Comprehensive Ecosystem Amendment. The Council, as indicated in the previous section, has already used many of the options recommended in the guidelines for managing adverse effects from fishing including: fishing equipment restrictions; seasonal and aerial restrictions on the use of specified equipment; 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 the Fishery Ecosystem Plan identifies non-fishing related activities that have the potential to adversely affect EFH quantity or quality. Examples of theses activities are dredging, fill, excavation, mining, impoundment, discharge, water diversions, thermal additions, actions that contribute to non-point source pollution and sedimentation, introduction of potentially hazardous materials, introduction of exotic species, and the conversion of aquatic habitat that may eliminate, diminish, or disrupt the functions of EFH. Included in this document is an analysis of how fishing and non-fishing activities influence habitat function on an ecosystem or watershed scale. This information presents available information describing the ecosystem or watershed and the dependence of managed species on the ecosystem or watershed. 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 the managed species' habitat is included.

General conservation and enhancement recommendations are included in Volume IV of the FEP and this CEA. These include but are not limited to recommending the enhancement of rivers, streams, and coastal areas, protection of water quality and quantity, recommendations to local and state organizations to minimize destruction/degradation of wetlands, restore and maintain the ecological health of watersheds, and replace lost or degraded EFH.

This Comprehensive Habitat Amendment (SAFMC 1998b), pursuant to the guidelines, and Volume IV of the Fishery Ecosystem Plan present areas which meet the criteria for designation of essential fish habitat-habitat areas of particular concern (EFH-HAPCs) by individual habitat type or managed species or species complex. The following criteria are considered when determining whether a type, or area of EFH is an essential fish habitat-habitat area of particular concern: (1) the importance of the ecological function provided by the habitat; (2) the extent to which the habitat is sensitive to human-induced environmental degradation; and (3) whether, and to what extent, development activities are, or will be, stressing the habitat type. The identification of EFH-HAPCs will continue through the public hearing process and the Council will consider additional areas if identified through this process. A coral HAPC process under the coral plan already exists and differs somewhat from the process recommended in the EFH guidelines.

The Council will periodically review and update EFH information and revise Fishery Ecosystem Plan as new information becomes available. NMFS should provide some of this information as part of the annual Stock Assessment and Fishery Evaluation (SAFE) report. A complete update of the FEP and assessment of EFH information will also be conducted as recommended in the guidelines in no longer than 5 years.

The Council established a framework procedure whereby additional EFH and EFH-HAPCs designations would be accomplished. This is described in Section 4.2.8 of the EFH Comprehensive Amendment (SAFMC 1998b).

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

With the Habitat Plan as a cornerstone, the Council is developing an ecosystem-based approach to resource management. Evolution of the Habitat Plan into a Fishery Ecosystem Plan, 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 essential fish habitat. This effort will provide a more comprehensive understanding of the biological, social and economic impacts of management

Over 18 workshops have been held to date to integrate and update habitat information and begin development of the South Atlantic Fishery Ecosystem Plan (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 conducted to date include:

- 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.

Writing Teams (composed of AP members, experts from state and federal agencies, universities and Council staff) will review, update and expand chapters of the Habitat

Plan and develop new chapters for the FEP (e.g., Ecosystem Modeling and Research Needs to support Ecosystem-Based Management). Information compiled during, and as follow-up to the workshops, is helping the Council meet the EFH mandate to update EFH and EFH-HAPC information and designations. This 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.
The FEP will be used to develop a Comprehensive Amendment/EIS for all Fishery Management Plans (FMPs).

An outline for the FEP was developed and approved by the Council in June 2005.

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. AP 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:

1. Energy exploration, development, transportation and hydro-power re-licensing;
2. Beach dredging and filling and large-scale coastal engineering;
3. Protection and enhancement of submerged aquatic vegetation;
4. Alterations to riverine, estuarine, and nearshore flows and
5. Marine aquaculture.

In 2005, the Council's policy on energy exploration, development and transportation was revised an updated. The new policy addresses impacts related to Liquefied Natural Gas (LNG), hydropower re-licensing and other renewable energy technologies such as wind farms. As part of the FEP development process, habitat policies have been updated and new ones developed (i.e. aquaculture).

The NOAA Fisheries, State and other Federal agencies apply EFH and EFH-HAPC designations and protection policies in the day-to-day permit review process. The revision and updating of existing habitat policies and the development of new policies is being coordinated with core agency representatives on the Habitat and Coral Advisory Panels.

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 model will 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 a the South Atlantic Ecopath with Ecosim Model complete a fully parameterized model which could expand capabilities the possibility of with development of embedded sub-models.

Cooperative Research to Support Ecosystem-Based Management

High Resolution Maps of Habitat on the South Atlantic Continental Shelf

The Council has 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 Exclusive Economic Zone (EEZ) from just north of Cape Hatteras (North Carolina) to Cape Canaveral (Florida), covering a depth range of 100-500 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. upwellings) and also represent productive fishery areas. Throughout the region, and toward the deeper end (350-450 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 (1-2 m) bathymetry maps are required for these areas.

A newly purchased NURP Autonomous Underwater Vehicle (AUV) "Eagle Ray" is being operated by NURC/UNCW. The unit will be maintained and operated by NURC/UNCW and be used in the initial testing by mapping deepwater coral and associated habitats in the South Atlantic.

Regional Internet Map Server for Coral and Live/Hard Bottom Habitat and South Atlantic Habitat/Ecosystem Web Site

The South Atlantic Council and the Florida Fish and Wildlife Research Institute (FWRI) have developed a Habitat and Ecosystem web site and an Internet Map Server (IMS). FWRI currently hosts the IMS application. The IMS currently includes over 100 layers of bottom type data, EFH and EFH-HAPCs, species' distributions, etc. Data layers and associated metadata can be downloaded or queried within the IMS. The applications has proven to be an effective tool for displaying, sharing and querying spatial information including that related to hard bottom and EFH throughout the South Atlantic region. The video and still imagery archives served from this site provide researchers a unique opportunity to observe important habitats and coral resources in the region.

A customized map wizard is also being developed for this project. FWRI is programming an ASP application that will provide users an alternative method to produce

maps. This application will have a user-friendly interface to select layers of interest, identify features from multiple layers, customize map sizes and modify legend elements.

The Council's Internet Mapping System is at:
http://ocean.floridamarine.org/efh_coral/ims/viewer.htm

1.3 Ecosystem management goals

The following are three broad goals adopted by the South Atlantic Council to support the move to Ecosystem Based Management 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 Fishery Ecosystem Plan, the South Atlantic ecosystem is defined as the region under the jurisdiction of the South Atlantic Council (Figure 1.) inland through coastal watersheds of the region. This area encompasses two connected Large Marine Ecosystems as defined by NOAA and given species migration and physical oceanographic characteristics presented in Section 9.3 interacts with the Gulf of Mexico Mid Atlantic Region and internationally with the Bahamas and the Sargasso Sea.

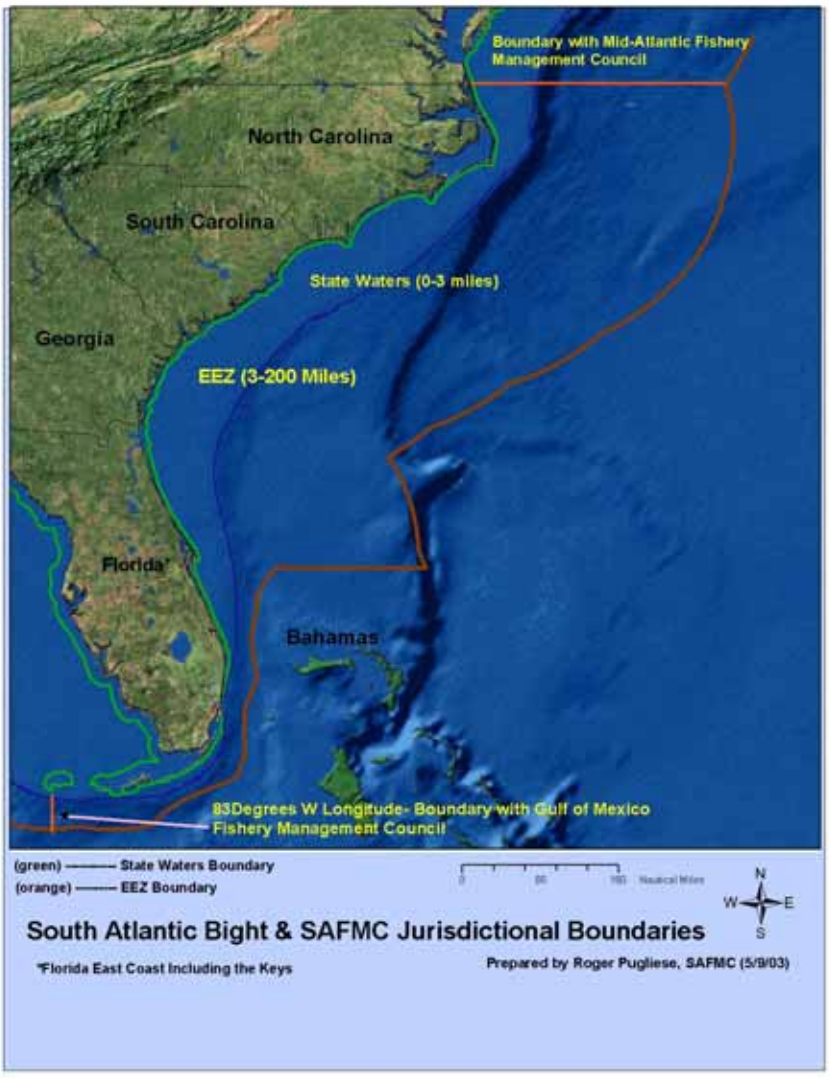

Figure 1. Jurisdictional boundaries of the South Atlantic Fishery Management Council.

2.2 Climate and weather

Section 9.3.1 Fisheries Oceanography in the South Atlantic Region presents a summary of the atmospheric and oceanographic characteristics of the Southeast Coastal Ocean.

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 Essential Fish Habitat and Essential Fish Habitat Areas of Particular Concern for managed species including prey.

2.4 Current approaches to management of fisheries in the South Atlantic

2.4.1 Traditional approaches

2.4.1.1 Area-based management

Special Management Zones (SMZs)

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 a 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 (MPAs)

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 Habitat Area of Particular Concern (HAPC) in order to protect the fragile coral. 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 a closed area. 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 MPAs for the Snapper Grouper Fishery

The Snapper Grouper Fishery Management Unit (FMU) is a complex of 73 species managed under the Snapper Grouper Fishery Management Plan by the South Atlantic

Fishery Management Council. The FMU is very 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 Plan Development Team 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 possible 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 1992 the Council held scoping meetings. During the 1992 scoping process support for and against the concept surfaced. The Council reviewed the scoping information at the January 1993 meeting and decided to: (1) recommend to National Marine Fisheries Service that they convene a Scientific Review Panel to review the concept of MPAs and (2) drop consideration of the marine reserve concept at that time.

A scientific review of the 1990 Snapper Grouper Plan Development Team report was completed by the Scientific Review Panel (NOAA 1995) as requested by the Council. 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 subject to the following conditions: (1) biological, ecological, social, and economic objectives of the marine reserves are clearly specified; (2) the relative biological, ecological, and economic impacts of marine reserves in the context of other fishery management measures have been estimated for various constituents; and (3) the development of marine reserve proposals proceed with the involvement of all constituencies and stakeholders.

Also the scientific review panel concluded that recognizing the alarming declines in stocks of key fishery species, the panel would urge that marine reserves options 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 (AP). An Action Plan was then developed that included three phases: (1) Phase I. Planning/Criteria Development, during which criteria where developed and questions were raised about the proper size, placement, and regulations within any potential marine reserves; (2) Phase II. Decision Phase in which the Council, drawing on input from 3 rounds of scoping meetings, a Marine Reserves Workshop, and the Marine Reserves AP made the decision that marine reserves were a necessary management tool for snapper grouper management; and (3) 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.

As a result of the input received from the 2000 scoping meetings, the Marine Reserves Workshop, advice from the Marine Reserves Areas Advisory Panel, the Scientific and Statistical Committee, and the Snapper Grouper Assessment Group, the Council voted to move forward with using marine reserves.

After deciding that marine reserves were a management tool that was 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 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, marine protected areas, etc. The different nomenclature associated with this management tool made things very confusing to the public and managers alike. 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 definition and intent. In order to be more consistent with national definitions the Council adopted the term Marine Protected Areas (MPAs).

Marine Protected Areas, as defined in Presidential Executive Order 13158, means 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 in any areas designated as 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 they 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). This definition 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 considered and presented to the public the following types of actions that they considered in 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 very 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 deep-water 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 in one depth stratum rarely consume those of the other (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 fishery for pelagic species such as marlins and tunas

Pelagic species are generally captured by trolling (i.e., towing artificial or live bait behind the wake of a vessel) at depths of 10 – 30 meters from the surface (Everhart and Youngs 1981). The proposed Type 2 MPAs are at depths ranging from 60-700 meters. However, methods used to troll for coastal migratory pelagics can access deep reef fishes. NOAA Fisheries researchers used a variety of gear types and techniques to assess the susceptibility of reef fish to trolling using downriggers at 200-400 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 (APs). The APs 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, and the Snapper Grouper AP met with the Council's Snapper Grouper Committee to provide additional input on the possible MPA sites. Based on input from the SSC, APs, 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 was useful in helping the 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 recommendations for design of marine reserves and MPAs, based on scientific hypotheses and observations from current projects. 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 proposed 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 proposed 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 overfishing5 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 in 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 Total Allowable Catch (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 Total Allowable Catch (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 let 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 Limited Access Privilege (LAP) program 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 Limited Access Privilege Programs 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 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 LAP Program 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 LAP Program Exploratory Workgroup. The Council approved the Workgroup membership and the Action Plan for LAPP consideration. The Workgroup will meet six times over the 2007 year to discuss the potential use of a LAPP for the South Atlantic snapper grouper fishery and to create a potential design of LAPP for this fishery.

Limited Access Privilege Program (LAP)
In March 2007, the South Atlantic Fishery Management Council formed the Limited Access Privilege Program (LAP) Exploratory Workgroup. 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 LAPs for the South Atlantic commercial snapper grouper fishery and what characteristics the Workgroup thought a LAP should have. The Workgroup also expressed the possible positive and negative impacts they could foresee of a LAP, prerequisites for a LAP, and goals and objectives for a LAP. These were incorporated into the document. The document also contains background information on various aspects of a LAP.

In early March 2008, the South Atlantic Fishery Management Council received the LAP 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. The Council requested that Sea Grant conduct an outreach program to gather information from the fishing industry about their ideas for LAPs and similar programs. The Council also directed Council staff to contact tilefish fishermen to ask about their interest in a possible LAP for the tilefish fishery. In June, the Council expects to hear back from Council staff on this issue.

A revised update will be provided following the June 9-13 Council meeting in Orlando. *Information about LAP Workgroup members, the Workgroup's final report, meeting* minutes, and background information on LAPs are all available on the Council website.

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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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Stock Assessment and Fishery Evaluation (SAFE) Report on the Snapper Grouper Fishery of the South Atlantic
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Status report on the continental United States distinct population segment of the goliath grouper (*Epinephelus itajara*)
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