Amendment 30

to the Fishery Management Plan for
the Snapper Grouper Fishery of the South
Atlantic Region

Vessel Monitoring Systems (VMS) for Vessels Harvesting Snapper Grouper Species

Environmental Impact Statement Regulatory Impact Review Fishery Impact Statement

JANUARY 2013

Definitions, Abbreviations, and Acronyms Used in the Document

ABC acceptable biological catch

ACL annual catch limits

AM accountability measures

ACT annual catch target

B a measure of stock biomass in either 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

CPUE catch per unit effort

DEIS draft environmental impact statement

EA environmental assessment

EEZ exclusive economic zone

EFH essential fish habitat

F a measure of the instantaneous rate of fishing mortality

$F_{30\%SPR}$ fishing mortality that will produce a static SPR = 30%

F_{CURR} the current instantaneous rate of fishing mortality

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

FMP fishery management plan

FMU fishery management unit

M natural mortality rate

MARMAP Marine Resources Monitoring Assessment and Prediction Program

MFMT maximum fishing mortality threshold

MMPA Marine Mammal Protection Act

MRFSS Marine Recreational Fisheries Statistics Survey

MRIP Marine Recreational Information Program

MSFCMA Magnuson-Stevens Fishery Conservation and Management Act

MSST minimum stock size threshold

MSY maximum sustainable yield

NEPA National Environmental Policy Act

NMFS National Marine Fisheries Service

NOAA National Oceanic and Atmospheric Administration

OFL overfishing limit

OY optimum yield

RIR regulatory impact review

SAMFC South Atlantic Fishery Management Council

SEDAR Southeast Data, Assessment, and Review

SEFSC Southeast Fisheries Science Center

SERO Southeast Regional Office

SIA social impact assessment

SPR spawning potential ratio

SSC Scientific and Statistical Committee

South Atlantic Snapper Grouper Amendment 30

Including a Environmental Impact Statement (EIS), Regulatory Impact Review (RIR), and Regulatory Flexibility Act Analysis (RFAA)

Abstract:
The purpose of this amendment is to require vessel monitoring systems on commercial vessels harvesting snapper grouper species. The proposed action would improve the following aspects of snapper grouper stocks: enforcement, science, and management.

Type of Action:

( ) Administrative
(X) Draft

( ) Legislative
( ) Final

Responsible Agencies:

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Dates:
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DEIS filed:
DEIS notice published:
DEIS comments received by:

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SUMMARY

of

AMENDMENT 30

to the Fishery Management Plan for the Snapper Grouper Fishery

of the South Atlantic Region

To be completed

Chapter 1.
Introduction

1.1 What Actions Are Being Proposed?

Fishery managers are proposing changes to regulations where commercial vessels harvesting snapper grouper species would be required to have a vessel monitoring system (VMS) onboard when fishing.

1.2 What is VMS?

VMS is a satellite communications system used to monitor fishing activities; for example, VMS may be used to ensure that vessels stay out of prohibited areas. The system is based on electronic devices (transceivers), which are installed onboard vessels. These devices automatically send data to a shore-based "satellite" monitoring system.

1.3 Who is Proposing the Actions?

The South Atlantic Fishery Management Council (South Atlantic Council) is proposing the actions. The South Atlantic Council recommends management measures and submits them to the National Marine Fisheries Service (NMFS) who ultimately approves, disapproves, or partially approves, and implements the actions in the amendment through the development of regulations on behalf of the Secretary of Commerce. NMFS is an agency in the National Oceanic and Atmospheric Administration within the Department of Commerce.

South Atlantic Fishery Management Council

- Responsible for conservation and management of fish stocks
- Consists of 13 voting members: 8 appointed by the Secretary of Commerce, 1 representative from each of the 4 South Atlantic states, the Southeast Regional Director of NMFS; and 4 non-voting members
- Responsible for developing fishery management plans and amendments under the Magnuson-Stevens Act; recommends actions to NMFS for implementation
- Management area is from 3 to 200 miles off the coasts of North Carolina, South Carolina, Georgia, and east Florida through Key West with the exception of Mackerel which is from New York to Florida, and Dolphin-Wahoo, which is from Maine to Florida

(Insert picture of VMS unit)

1.4 Where is the Project Located?

Management of the federal snapper grouper fishery located off the southeastern United States (South Atlantic) in the 3-200 nautical miles U.S. Exclusive Economic Zone is conducted under the Snapper Grouper FMP, SAFMC 1983) (**Figure 1-1**).

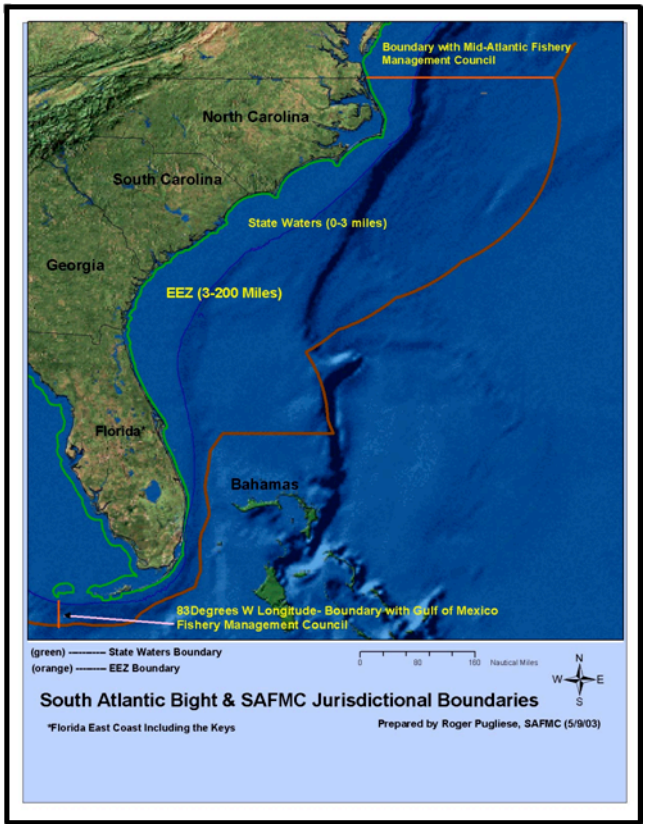

Figure 1-1. Jurisdictional boundaries of the South Atlantic Fishery Management Council.

1.5 Why is the Council Considering Action?

The Council is considering requiring VMS on commercial vessels harvesting snapper grouper species in order to improve the following aspects of snapper grouper stocks: enforcement, science, and management *(see text box)*. VMS also will result in other benefits as discussed in the following sections.

Note: The purpose and need below is recommended by IPT for Council's consideration:

Purpose for Action

Require commercial vessels harvesting snapper grouper stocks in the South Atlantic be equipped with a satellite communications (vessel monitoring system (VMS)) to monitor fishing activities.

Need for Action

Improve the following aspects of snapper grouper stocks.

1. *Enforcement.* There is a need to reduce illegal fishing activity and improve enforceability of regulations. Increased enforceability of area restrictions is needed to prevent excessive fishing pressure in protected areas that contain snapper grouper populations and habitat that supports these populations. There is also a need to more accurately track and monitor locations where vessels will land fish, specify harvest composition (e.g., harvest amounts, species), and identify gear possessed onboard.

2. *Science.* There is a need to have a better understanding of snapper grouper populations by providing specific information on locations where fish are caught, and species composition of retained and discarded fish.

3. *Management.* There is a need to improve management efforts by providing fishery managers information that will help them implement regulations with greater biological protection to snapper grouper stocks, and reduced socio-economic effects to fishermen and fishing communities.

1.6 How Would VMS Improve Enforceability?

To be completed

1.7 How Would VMS Improve Science and Data Collection?

To be completed.

1.8 How Would the Management and the Regulations?

The Snapper Grouper FMP contains several area-specific regulations where fishing is restricted or prohibited in order to protect habitat or spawning aggregations, or to reduce fishing pressure in areas. Unlike size, bag and trip limits, where the catch can be monitored onshore when a vessel returns to port, area restrictions require at-sea enforcement. However, atsea enforcement of offshore area restrictions is difficult due to the distance from shore and limited number of patrol vessels, resulting in a need to improve enforceability of area fishing restrictions through remote sensing methods. VMS is needed to improve enforcement of area restrictions. VMS would improve enforceability of area restrictions in order to prevent excessive fishing pressure in stressed areas or on spawning aggregations of reef fish, and to enhance the ability of enforcement agencies to detect and prevent the use of fishing gear in areas where that gear is restricted because it could potentially damage sensitive habitat. There is also a need to more accurately track and monitor locations where vessels will land fish, specify harvest composition (e.g., harvest amounts, species), and identify gear possessed onboard.

Chapter 2. Proposed Action and Alternatives

2.1 Alternatives to Amend the Snapper Grouper Fishery Management Plan to require all commercial snapper grouper fishing vessels to be equipped with VMS

Alternative 1 (no action). Currently snapper grouper vessels are not required to be equipped with VMS.

Alternative 2. Require all commercial snapper grouper fishing vessels with a Federal unlimited or trip-limited permit to be equipped with VMS. The purchase, installation, and maintenance of VMS equipment must conform to the protocol established by NMFS in the Federal Register. Purchase of VMS equipment will be reimbursed by the NOAA Office of Law Enforcement from the VMS reimbursement account if funding is available. Installation, maintenance, and communication costs will be paid for or arranged by the permit holder.

Alternative 3 (Preferred). Only if funding for VMS equipment reimbursement is available from the VMS reimbursement account, require all commercial snapper grouper fishing vessels with a Federal unlimited or trip-limited permit to be equipped with VMS. The purchase, installation, and maintenance of VMS equipment must conform to the protocol established by NMFS in the Federal Register. Purchase of VMS equipment will be reimbursed by the *NOAA* Office of Law Enforcement from the VMS reimbursement account. Installation, maintenance, and communication costs will be paid for or arranged by the permit holder.

2.2 Comparison Effects Summary of Alternatives

To be completed

Chapter 3. Affected Environment

This section describes the affected environment in the proposed project area. The affected environment is divided into four major components:

Affected Environment

- **Habitat environment (Section 3.1)**

  Examples include coral reefs,sea grass beds, and rocky hard-bottom substrates

- **Biological end ecological environment (Section 3.2)**

  Examples include populations of red snapper, corals, turtles

- **Human environment (Section 3.3)**

  Examples include fishing communities and economic descriptions of the fisheries

- **Administrative environment (Section 3.4)**

  Examples include the fishery management process and enforcement activities

3.1 Habitat Environment

Many snapper grouper species utilize both open-water and bottom habitats during several life-history stages; larval stages of these species live in the water column and feed on plankton. Most juveniles and adults are bottom-dwellers and associate with hard structures on the continental shelf that have moderate to high relief (e.g., coral reef systems and artificial reef structures, rocky hard-bottom substrates, ledges and caves, sloping soft-bottom areas, and limestone outcroppings). Juvenile stages of some snapper grouper species also utilize inshore seagrass beds, mangrove estuaries, lagoons, oyster reefs, and embayment systems. In many species, various combinations of these habitats may be utilized during daily feeding migrations or seasonal shifts in cross-shelf distribution.

Predominant snapper grouper offshore fishing areas are located in live-bottom and shelf-edge habitats, where water temperatures range from 11° to 27°C (52° to 81°F) due to the proximity of the Gulf Stream, with lower shelf habitat temperatures varying from 11° to 14°C (52° to 57°F). Water depths range from 16 to 27 meters (54 to 90 feet) or greater for live-bottom habitats, 55 to 110 meters (180 to 360 feet) for the shelf-edge habitat, and from 110 to 183 meters (360 to 600 feet) for lower-shelf habitat areas.

Artificial reef structures are also utilized to attract fish and increase fish harvests; however, research on artificial reefs is limited and opinions differ as to whether or not these structures promote an increase of ecological biomass or merely concentrate fishes by attracting them from nearby, natural unvegetated areas of little or no relief.

More detail on these habitat types is found in Volume II of the South Atlantic Fishery Management Council's (South Atlantic Council) Fishery Ecosystem Plan (SAFMC 2009b) available at: http://www.safmc.net/ecosystem/Home/EcosystemHome/tabid/435/Default.aspx

3.1.1 Essential Fish Habitat

Essential fish habitat (EFH) is defined in the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) as "those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S. C. 1802(10)). Specific categories of EFH identified in the South Atlantic Bight, which are utilized by federally managed fish and invertebrate species, include both estuarine/inshore and marine/offshore areas.

EFH utilized by snapper grouper species in the South Atlantic region includes coral reefs, live/hard bottom, submerged aquatic vegetation, artificial reefs, and medium to high profile outcroppings on and around the shelf break zone from shore to at least 183 meters [600 feet (but to at least 2,000 feet for wreckfish)] where the annual water temperature range is sufficiently warm to maintain adult populations of members of this largely tropical fish complex. EFH includes the spawning area in the water column above the adult habitat and the additional pelagic environment, including *Sargassum*, required for survival of larvae and growth up to and including settlement. In addition, the Gulf Stream is also EFH because it provides a mechanism to disperse snapper grouper larvae.

For specific life stages of estuarine-dependent and near shore snapper grouper species, EFH includes areas inshore of the 30 meters (100-foot) contour, such as attached microalgae; submerged rooted vascular plants (seagrasses); estuarine emergent vegetated wetlands (saltmarshes, brackish marsh); tidal creeks; estuarine scrub/shrub (mangrove fringe); oyster reefs and shell banks; unconsolidated bottom (soft sediments); artificial reefs; and coral reefs and live/hard bottom habitats.

3.1.2 Habitat Areas of Particular Concern

Areas which meet the criteria for EFH-habitat areas of particular concern (EFH-HAPCs) for species in the snapper grouper management unit include medium to high profile offshore hard bottoms where spawning normally occurs; localities of known or likely periodic spawning aggregations; near shore hard bottom areas; The Point, The Ten Fathom Ledge, and Big Rock (North Carolina); The Charleston Bump (South Carolina); mangrove habitat; seagrass habitat; oyster/shell habitat; all coastal inlets; all state-designated nursery habitats of particular importance to snapper grouper (e.g., Primary and Secondary Nursery Areas designated in North Carolina); pelagic and benthic *Sargassum*; Hoyt Hills for wreckfish; the Oculina Bank Habitat Area of Particular Concern; all hermatypic coral habitats and reefs; manganese outcroppings on the Blake Plateau; and Council-designated Artificial Reef Special Management Zones (SMZs). Areas that meet the criteria for designating essential fish habitat-habitat

areas of particular concern include habitats required during each life stage (including egg, larval, postlarval, juvenile, and adult stages).

3.2 Biological and Ecological Environment

The reef environment in the South Atlantic management area affected by actions in this environmental assessment is defined by two components (**Figure 3-1**). Each component will be described in detail in the following sections.

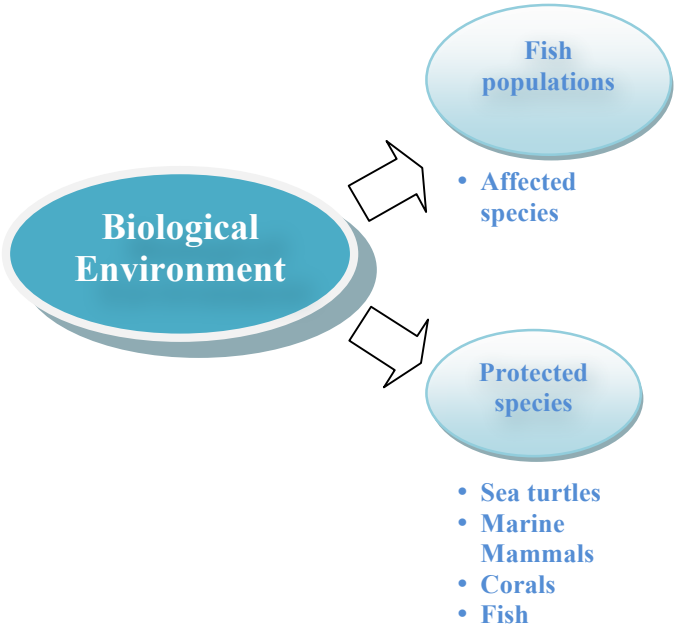

Figure 3-1. Two components of the biological environment described in this document.

3.2.1 Fish Populations

The waters off the South Atlantic coast are home to a diverse population of fish. The snapper grouper fishery management unit contains 60 species of fish, many of them neither "snappers" or "groupers". These species live in depths from a few feet (typically as juveniles) to hundreds of feet. As far as north/south distribution, the more temperate species tend to live in the upper reaches of the South Atlantic management area (black sea bass, red porgy) while the tropical variety's core residence is in the waters off south Florida, Caribbean Islands, and northern South America (black grouper, mutton snapper).

These are reef-dwelling species that live amongst each other. These species rely on the reef environment for protection and food. There are several reef tracts that follow the southeastern coast. The fact that these fish populations congregate together dictates the nature of the fishery (multi-species) and further forms the type of management regulations proposed in this document.

Snapper grouper species commonly taken with red snapper could be affected by the action. In addition to red snapper, snapper grouper species most likely to be affected by the proposed actions includes many species that occupy the same habitat at the same time. Therefore, snapper grouper species are likely to be caught when regulated since they will be incidentally caught when fishermen target other co-occurring species (See Section 3.2.5 for a discussion of the co-occurring species).

3.2.6 Protected Species

There are 31 different species of marine mammals that may occur in the exclusive economic zone (EEZ) of the South Atlantic region. All 31 species are protected under the Marine Mammal Protection Act (MMPA) and six are also listed as endangered under the Endangered Species Act (ESA) (i.e., sperm, sei, fin, blue, humpback, and North Atlantic right whales). In addition to those six marine mammals, five species of sea turtle (green, hawksbill, Kemp's ridley, leatherback, and loggerhead); the smalltooth sawfish; two *Acropora* coral species (elkhorn [*Acropora palmata*] and staghorn [*A. cervicornis*]), and five distinct population segments (DPS) of Atlantic sturgeon are protected under the ESA. **Section 3.5** of Amendment 17A to the Snapper Grouper FMP, describes the life history characteristics in detail for all these species other than Atlantic sturgeon. Below is a brief description of the life history characteristics for the DPSs of Atlantic sturgeon. The potential impacts from the continued authorization of the South Atlantic snapper-grouper fishery on all ESA-listed species have been considered in previous ESA Section 7 consultations. Summaries of those consultations and their determination are in Appendix G.

Five separate DPSs of the **Atlantic sturgeon** (*Acipenser oxyrinchus oxyrinchus*) were listed under the ESA effective April 6, 2012 (76 FR 5914; February 12, 2012). From north to south, the DPSs are the Gulf of Maine, New York Bight, Chesapeake Bay, Carolina, and South Atlantic (**Figure 3-3**). The New York Bight, Chesapeake Bay, Carolina, and South Atlantic DPSs are listed as endangered, and the Gulf of Maine DPS is listed as threatened. The five DPSs were listed under the ESA as a result of threats from a combination of habitat curtailment and modification, overutilization (i.e., being taken as bycatch) in commercial fisheries, and the inadequacy of regulatory mechanisms in ameliorating these impacts and threats.

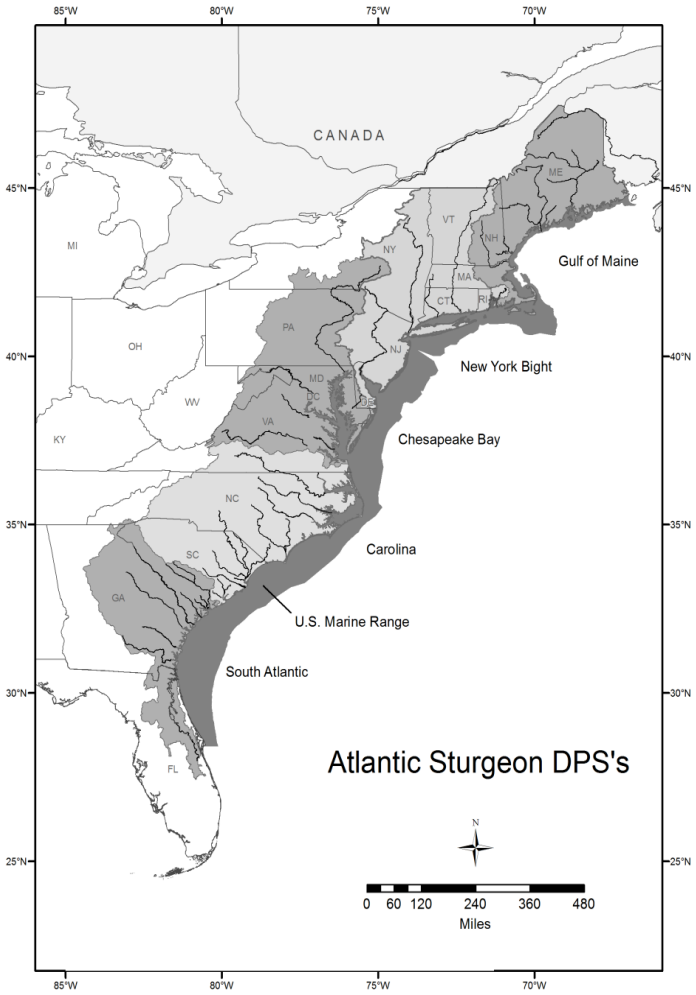

Figure 3-3. Map depicting the five DPSs of Atlantic sturgeon.

Atlantic sturgeon are long-lived, estuarine dependent, anadromous[1] fish (Bigelow and Schroeder 1953, Vladykov and Greeley 1963, Mangin 1964, Pikitch et al. 2005, Dadswell 2006, ASSRT 2007), that historically occurred from Labrador south to the St. Johns River, Florida. Generally, Atlantic sturgeon use coastal bays, sounds, and ocean waters in depths less than 132 ft (Vladykov and Greeley 1963, Murawski and Pacheco 1977, Dovel and Berggren 1983, Smith 1985, Collins and Smith 1997, Welsh et al. 2002, Savoy and Pacileo 2003, Stein et al. 2004, USFWS 2004, Laney et al. 2007, Dunton et al. 2010, Erickson et al. 2011, Wirgin and King 2011), where they feed on a variety of benthic invertebrates and fish (Bigelow and Schroeder 1953, ASSRT 2007, Guilbard et al. 2007, Savoy 2007). Mature Atlantic sturgeon make spawning migrations from estuarine waters to rivers as water temperatures reach 43ºF for males (Smith et al. 1982, Dovel and Berggren 1983, Smith 1985, ASMFC 2009) and 54ºF for females (Dovel and Berggren 1983, Smith 1985, Collins et al. 2000a), typically between February (southern systems) and July (northern systems). Individuals spawn at intervals of once every 1-5 years for males and once every 2-5 years for females. Spawning is believed to occur in flowing water between the salt front of estuaries and the fall line of large rivers, when and where optimal flows are 18-30 in/s and depths are 36-89 ft (Borodin 1925, Dees 1961, Leland 1968, Scott and

[1] Anadromous refers to a fish that is born in freshwater, spends most of its life in the sea, and returns to freshwater to spawn (NEFSC FAQ's, available at http://www.nefsc.noaa.gov/faq/fishfaq1a.html, modified June 16, 2011)

Crossman 1973, Crance, 1987, Shirey et al. 1999, Bain et al. 2000, Collins et al. 2000a, Caron et al. 2002, Hatin et al. 2002, ASMFC 2009). Females may produce 400,000 to 4 million eggs per spawning year (Vladykov and Greeley 1963, Smith et al., 1982, Van Eenennaam et al. 1996, Van Eenennaam and Doroshov 1998, Stevenson and Secor 1999, Dadswell 2006) and deposit eggs on hard bottom substrate such as cobble, coarse sand, and bedrock (Dees 1961, Scott and Crossman 1973, Gilbert 1989, Smith and Clugston 1997, Bain et al. 2000, Collins et al. 2000a, Caron et al. 2002, Hatin et al. 2002, Mohler, 2003, ASMFC 2009). Upon hatching, studies suggest that early juvenile Atlantic sturgeon (age-0 [i.e., YOY], age-1, and age-2) remain in low salinity waters of their natal estuaries (Haley 1999, Hatin et al. 2007, McCord et al. 2007, Munro et al. 2007) for months to years before emigrating to open ocean as subadults (Holland and Yelverton 1973, Dovel and Berggen 1983, Waldman et al. 1996, Dadswell 2006, ASSRT 2007). Growth rates and age at maturity are both influenced by water temperature, as Atlantic sturgeon grow larger and mature faster in warmer waters. Atlantic sturgeon may live up to 60 years, reach lengths up to 14 feet and weigh over 800 lbs. Tagging studies and genetic analyses (Wirgin et al. 2000, King et al. 2001, Waldman et al. 2002, ASSRT 2007, Grunwald et al. 2008) indicate that Atlantic sturgeon exhibit ecological separation during spawning throughout their range that has resulted in multiple, genetically distinct, interbreeding population segments.

The construction of dams, dredging, and modification of water flows have reduced the amount and quality of habitat available for Atlantic sturgeon spawning and foraging. Water quality (temperature, salinity, and dissolved oxygen) has also been reduced by terrestrial activities, leading to further declines in available spawning and nursery habitat. Although spawning historically occurred within many Atlantic coast rivers, only 16 U.S. rivers are known to currently support spawning based on available evidence (i.e., presence of YOY or gravid Atlantic sturgeon documented within the past 15 years) (ASSRT 2007).

Overutilization of Atlantic sturgeon from directed fishing caused initial severe declines in Atlantic sturgeon populations in the Southeast, from which they have never recovered. Although directed harvest of this species has ceased, Atlantic sturgeon continue to be incidentally caught as bycatch in other commercial fisheries. Because Atlantic sturgeon mix extensively in marine waters and may utilize multiple river systems for nursery and foraging habitat in addition to their natal spawning river, they are subject to being caught in multiple fisheries throughout their range. Additionally, Atlantic sturgeon are more sensitive to bycatch mortality because they are a long-lived species, have an older age at maturity, have lower maximum fecundity values, and a large percentage of egg production occurs later in life. Based on these life history traits, Boreman (1997) calculated that Atlantic sturgeon can only withstand the annual loss of up to five percent of their population to bycatch mortality without suffering population declines. Mortality rates of Atlantic sturgeon taken as bycatch in various types of fishing gear range between 0-51 percent, with the greatest mortality occurring in sturgeon caught by sink gillnets. While many of the threats to the Atlantic sturgeon have been ameliorated or reduced due to the existing regulatory mechanisms, such as the moratorium on directed fisheries for Atlantic sturgeon, bycatch is currently not being addressed through existing mechanisms.

The recovery of Atlantic sturgeon along the Atlantic Coast, especially in areas where habitat is limited and water quality is severely degraded, will require improvements in the following areas: (1) elimination of barriers to spawning habitat either through dam removal, breaching, or installation of successful fish passage facilities; (2) operation of water control structures to provide appropriate flows, especially during spawning season; (3) imposition of dredging restrictions including seasonal moratoriums and avoidance of spawning/nursery habitat; and, (4) mitigation of water quality parameters

that are restricting sturgeon use of a rivers (i.e., DO). Stronger regulatory mechanisms may likely aid in achieving these improvements. These regulatory mechanisms may also aid in reducing bycatch mortality in commercial fisheries, again assisting in the recovery of the species.

3.3 Socio-economic Environment

To be completed.

3.3.X Environmental Justice Considerations

Executive Order 12898 requires federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. This executive order is generally referred to as environmental justice (EJ).

To evaluate EJ considerations for the proposed actions, information on poverty and minority rates is examined at the county level. Information on the race and income status for groups at the different participation levels (vessel owners, crew, dealers, processors, employees, employees of associated support industries, etc.) is not available. Because the proposed actions would be expected to affect fishermen and associated industries in several communities along the South Atlantic coast and not just those profiled, it is possible that other counties or communities have poverty or minority rates that exceed the EJ thresholds.

In order to identify the potential for EJ concern, the rates of minority populations (non-white, including Hispanic) and the percentage of the population that was below the poverty line were examined. The threshold for comparison that was used was 1.2 times the state average for minority population rate and percentage of the population below the poverty line. If the value for the community or county was greater than or equal to 1.2 times the state average, then the community or county was considered an area of potential EJ concern. Census data for the year 2000 was used. Estimates of the state minority and poverty rates, associated thresholds, and community rates are provided in **Table 3-23**; note that only communities that exceed the minority threshold and/or the poverty threshold are included in the table**.**

While some communities expected to be affected by this proposed amendment may have minority or economic profiles that exceed the EJ thresholds and, therefore, may constitute areas of concern, significant EJ issues are not expected to arise as a result of this proposed amendment. No adverse human health or environmental effects are expected to accrue to this proposed amendment, nor are these measures expected to result in increased risk of exposure of affected individuals to adverse health hazards. The proposed management measures would apply to all participants in the affected area, regardless of minority status or income level, and information is not available to suggest that minorities or lower income persons are, on average, more dependent on the affected species than non-minority or higher income persons.

3.4 Administrative Environment

3.4.1 The Fishery Management Process and Applicable Laws

3.4.1.1 Federal Fishery Management

Federal fishery management is conducted under the authority of the Magnuson-Stevens Act (16 U.S.C. 1801 et seq.), originally enacted in 1976 as the Fishery Conservation and Management Act. The Magnuson-Stevens Act claims sovereign rights and exclusive fishery management authority over most fishery resources within the EEZ, an area extending 200 nm from the seaward boundary of each of the coastal states, and authority over U.S. anadromous species and continental shelf resources that occur beyond the U.S. EEZ.

Responsibility for federal fishery management decision-making is divided between the U.S. Secretary of Commerce (Secretary) and eight regional fishery management councils that represent the expertise and interests of constituent states. Regional councils are responsible for preparing, monitoring, and revising management plans for fisheries needing management within their jurisdiction. The Secretary is responsible for collecting and providing the data necessary for the councils to prepare fishery management plans and for promulgating regulations to implement proposed plans and amendments after ensuring that management measures are consistent with the Magnuson-Stevens Act and with other applicable laws. In most cases, the Secretary has delegated this authority to NMFS.

The South Atlantic Council is responsible for conservation and management of fishery resources in federal waters of the U.S. South Atlantic. These waters extend from 3 to 200 mi offshore from the seaward boundary of North Carolina, South Carolina, Georgia, and east Florida to Key West. The South Atlantic Council has thirteen voting members: one from NMFS; one each from the state fishery agencies of North Carolina, South Carolina, Georgia, and Florida; and eight public members appointed by the Secretary. On the South Atlantic Council, there are two public members from each of the four South Atlantic States. Non-voting members include representatives of the U.S. Fish and Wildlife Service, U.S. Coast Guard, State Department, and Atlantic States Marine Fisheries Commission (ASMFC). The South Atlantic Council has adopted procedures whereby the non-voting members serving on the South Atlantic Council Committees have full voting rights at the Committee level but not at the full South Atlantic Council level. South Atlantic Council members serve three-year terms and are recommended by state governors and appointed by the Secretary from lists of nominees submitted by state governors. Appointed members may serve a maximum of three consecutive terms.

Public interests also are involved in the fishery management process through participation on Advisory Panels and through council meetings, which, with few exceptions for discussing personnel matters, are open to the public. The South Atlantic Council uses its Scientific and Statistical Committee (SSC) to review the data and science being used in assessments and fishery management plans/amendments. In addition, the regulatory process is in accordance with the Administrative Procedure Act, in the form of "notice and comment" rulemaking.

3.4.1.2 State Fishery Management

The state governments of North Carolina, South Carolina, Georgia, and Florida have the authority to manage fisheries that occur in waters extending three nautical miles from their respective shorelines. North Carolina's marine fisheries are managed by the Marine Fisheries Division of the North Carolina Department of Environment and Natural Resources. The Marine Resources Division of the South Carolina Department of Natural Resources regulates South Carolina's marine fisheries. Georgia's marine fisheries are managed by the Coastal Resources Division of the Department of Natural Resources. The Marine Fisheries Division of the Florida Fish and Wildlife Conservation Commission is responsible for managing Florida's marine fisheries. Each state fishery management agency has a designated seat on the South Atlantic Council. The purpose of state representation at the South Atlantic Council level is to ensure state participation in federal fishery management decision-making and to promote the development of compatible regulations in state and federal waters.

The South Atlantic States are also involved through the ASMFC in management of marine fisheries. This commission was created to coordinate state regulations and develop management plans for interstate fisheries. It has significant authority, through the Atlantic Striped Bass Conservation Act and the Atlantic Coastal Fisheries Cooperative Management Act, to compel adoption of consistent state regulations to conserve coastal species. The ASFMC is also represented at the South Atlantic Council level, but does not have voting authority at the South Atlantic Council level.

NMFS' State-Federal Fisheries Division is responsible for building cooperative partnerships to strengthen marine fisheries management and conservation at the state, inter-regional, and national levels. This division implements and oversees the distribution of grants for two national (Inter-jurisdictional Fisheries Act and Anadromous Fish Conservation Act) and two regional (Atlantic Coastal Fisheries Cooperative Management Act and Atlantic Striped Bass Conservation Act) programs. Additionally, it works with the ASMFC to develop and implement cooperative State-Federal fisheries regulations.

3.4.1.3 Enforcement

Both the National Oceanic and Atmospheric Administration (NOAA) Fisheries Office for Law Enforcement (NOAA/OLE) and the United States Coast Guard (USCG) have the authority and the responsibility to enforce South Atlantic Council regulations. NOAA/OLE agents, who specialize in living marine resource violations, provide fisheries expertise and investigative support for the overall fisheries mission. The USCG is a multi mission agency, which provides at sea patrol services for the fisheries mission.

Neither NOAA/OLE nor the USCG can provide a continuous law enforcement presence in all areas due to the limited resources of NOAA/OLE and the priority tasking of the USCG. To supplement at sea and dockside inspections of fishing vessels, NOAA entered into Cooperative Enforcement Agreements with all but one of the states in the Southeast Region (North Carolina), which granted authority to state officers to enforce the laws for which NOAA/OLE has jurisdiction. In recent years, the level of involvement by the states has increased through Joint Enforcement Agreements, whereby states conduct

patrols that focus on federal priorities and, in some circumstances, prosecute resultant violators through the state when a state violation has occurred.

The NOAA Office of General Counsel Penalty Policy and Penalty Schedules can be found at www.gc.noaa.gov/enforce-office3.html.

Chapter 4. Environmental Consequences and Comparison of Alternatives

4.1 Effects of Amending the Snapper Grouper Fishery Management Plan to require all commercial snapper grouper fishing vessels to be equipped with VMS

4.1.1 Biological Effects

Alternative 2 and **Alternative 3** would require use of VMS that would improve our biological understanding of the fishery. Amendment 5 to the FMP for the Shrimp Fishery of the South Atlantic Region (SAFMC 2002) required the use of VMS technology for South Atlantic permitted rock shrimp vessels. The South Atlantic Council concluded that rock shrimp vessels carrying an approved VMS unit would improve compliance and allow the rock shrimp industry to demonstrate they are not fishing within any closed areas, specifically the Oculina Bank Coral Habitat Area of Particular Concern. The Comprehensive Ecosystem-Based Amendment (CE-BA) 1 explored the idea of VMS for the golden crab fishery but after discussions with the fishery participants and law enforcement, it was determined that VMS is not an effective tool to monitor the location of golden crab fishing gear. However, VMS is being explored as an option in Amendment 6 to the FMP for the Golden Crab Fishery of the South Atlantic Region.

Alternatives[1]
(preferred alternative in red)

1. No action. Do not require VMS on federally-permitted snapper grouper vessels.
2. Require VMS on federally-permitted snapper grouper vessels. Purchase of VMS unit will be reimbursed through the VMS reimbursement account.
3. Only if money for VMS reimbursement is available in the VMS reimbursement account, require VMS on federally-permitted snapper grouper vessels. Purchase of VMS unit will be reimbursed through the VMS reimbursement account.

[1]See Chapter 2 for a more detailed description of the alternatives.

Knowing where fishermen are fishing would help understand how fishing pressure is distributed across the bottom habitat. This information could be used in stock assessments and would be helpful in documenting impacts of regulations that may close fishing in certain areas (e.g., MPAs are under consideration in Snapper Grouper Regulatory Amendment 17). This would result in positive indirect biological effects relative to **Action 1 (No Action)**.

4.1.2 Economic Effects

Vessel monitoring systems (VMS) are used for tracking real-time vessel positioning. Knowing vessel location can assist in enforcing existing fisheries regulations, as well as in the development of new fisheries regulations. It can also be used to improve stock assessments by showing how fishing effort is distributed.

Alternative 1 (No Action) would not have economic impacts on the participants in the snapper grouper fishery. However, the lack of VMS makes it difficult for fisheries managers to understand completely the impacts of fishing behavior. **Alternative 2** has direct economic impacts on the participants in the snapper grouper fishery. VMS unit costs differ depending upon the model purchased. While **Alternative 2** would result in significant direct economic effects on fishing businesses/operations, the resulting data would significantly improve the ability of fishery managers to understand fishing behavior, identify productive fishing areas, and potential impacts to habitat.

The NMFS-approved VMS unit costs are shown in **Table 4-2**. The VMS regulations changed in 2008 and now only authorize the purchase of Enhanced Mobile Transmitting Units (EMTU). These are VMS units that have a computer screen which enables the fishermen to submit any required forms or make required declarations or pre-landing notices. Previously, highly migratory species and rock shrimp vessel owners were able to purchase "pingers" only, which were half the cost of these newer units. All fisheries where VMS units are required are now required to comply with the new EMTU requirements.

The NMFS Office of Law Enforcement has a fund to pay for the hardware costs of VMS units for all vessels affected by **Alternative 2** (Personal communication with Otha Easley, NMFS Office of Law Enforcement, October 3, 2012). However, the fund only pays for the cost of the hardware (up to $3,100, assuming an owner has not previously been reimbursed for another VMS unit on the same vessel). All South Atlantic Snapper Grouper Permit holders (both the Unlimited Permit and the 225-lb Permit) would have to pay for the installation, maintenance, and communications charges associated with having VMS (**Tables 4-3** and **4-4)**.

Table 4-2. NMFS-approved VMS units and costs.

Brand and Model	Cost
Boatracs FMCT-G	$3,095
Thrane and Thrane TT-3026D	$2,495
Faria Watchdog KTW304	$3,295
CLS America Thorium TST	$3,095

Source: Data provided by NMFS Office of Law Enforcement, July 2012.

Installation costs are approximately $300 per unit depending upon location of the vessel and installer. Maintenance costs cannot be estimated with existing information. Communication costs for each of the models average from $35 to $80 per month, depending on owner data usage, and are provided in (**Table 4-3)**.

Table 4-3. NMFS-approved VMS communications costs.

1. Qualcomm (for Boatracs units) \$30/mo satellite fee, \$.30/message, \$.006 per character for messaging (average price estimated \$35/month which includes 24/7 operations center support)
2. Telenor (for Thrane units) \$.06 per position report or \$1.44 per day for 1 hour reporting. If in the "In Harbor" mode, then \$.36 per day. Messaging costs \$.24 per e-mail. (\$30/mo average)
3. Iridium/Cingular Wireless (for Faria units) \$50.25 per month which includes 12,000 Iridium bytes and 35,000 GSM bytes for email and e-forms reporting.
4. Iridium (for CLS America units) \$45 per month for hourly reporting, \$1.75 per Kbyte for e-mail or forms submission.

Source: Data provided by NMFS Office of Law Enforcement, July 2012.

With approximately 693 South Atlantic Snapper Grouper Permits, the annual aggregate costs of implementing VMS, assuming management subsidizes the cost of the VMS units are summarized in **Table 4-4**.

Table 4-4. Summary of potential annual costs to fishermen of implementation assuming VMS unit cost is subsidized.

Alternatives	Unit Cost (fishermen)	Implementation of Unit (fishermen)	Unit Maintenance (fishermen)	Communication Costs (fishermen)	Total Cost (fishermen)[2]
First year	\$0	\$210,00	Unknown	\$252,000-\$672,000	\$462,000-\$882,000 + maintenance cost
Subsequent years	\$0[3]	NA	Unknown	\$252,000-\$672,000	\$252,000-672,000 + maintenance cost

(Source: Based on data provided by P. O'Shaughnessy, NMFS Office of Law Enforcement.)

Note 1: This table assumes that only the VMS hardware unit cost is subsidized through the NMFS OLE VMS Fund.
Note 2: The Total Cost column uses the lower Unit Cost and lower Communication Cost estimates to calculate the value at the lower end of the range. Likewise, the Total Cost column uses the higher Unit Cost and higher Communication Cost estimates to calculate the value at the lower end of the range.
Note 4: These costs do not include the incremental administrative costs associated with data collection, employees, function, and maintenance of the VMS system for the golden crab fishery.

Alternative 2 would have economic effects affecting producer surplus (profit) for fishing businesses/operations through ongoing transmission costs, maintenance, future unit replacement, and lost fishing opportunities due to fishing trips that would need to be ended early should the VMS unit fail to operate properly for any reason once the vessel has left port. Additionally, should funds not be available from the NMFS Office of Law Enforcement to subsidize the purchase of VMS units, fishermen would have to pay the cost of their VMS unit. Implementation of VMS would further reduce vessel and industry producer surplus because the use of a VMS is not expected to either increase revenue or decrease other fishing costs (those not associated with the VMS).

4.1.3 Social Effects

The VMS requirement under **Alternative 2** would result in a range of effects on the commercial snapper grouper fleet. In part, negative impacts would be associated with the economic impacts of additional cost for the vessel owner, particularly small fishing operations, but it is also likely that many fishermen would oppose a VMS requirement because of the independent characteristic of the industry. **Alternative 1** would be expected to result in minimal or no negative impacts on the commercial snapper grouper fleet, although some long-term benefits could be expected under **Alternative 2**.

VMS on all commercial snapper grouper vessels would be expected to improve data collection, enforcement, and compliance with reporting requirements, area closures, seasonal closures, and other management measures. A VMS mandate for all commercial snapper grouper vessels would eliminate the unfair advantage to fishermen who do not comply with regulations and fish when and where it is not allowed. Overall, the benefits to the entire commercial snapper grouper fleet would be expected to outweigh the negative impacts of the VMS requirement in **Alternative 2**.

4.1.4 Administrative Effects

Alternative 1 would not establish a requirement for VMS aboard snapper grouper vessels and would not impact the administrative environment. **Alternative 2** would result in large administrative impacts to both the agency and the fishery participants. Under **Alternative 2**, all commercial snapper grouper vessels would be required to have VMS onboard their vessel. Administrative impacts associated with this alternative relate to rule-making, enforcement, monitoring, and education and outreach. Establishing a VMS provision is not a trivial administrative task on the side of the agency and would result in significant burden. For the fishery participants, the same is true.

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Chapter 5. Reasoning for Council's Choice of Preferred Alternatives

At the September 2012 meeting, this measure was moved from an alternative under Action 2 to a stand-alone Action. The Council discussed their intent with requiring VMS for commercial snapper grouper vessels as in part an enforcement tool but also as a tool for data collection because it would allow managers to track where vessels are fishing for use in future discussions of spatial management of these areas.

The Gulf Council requires vessels in the reeffish fishery to use VMS and this requirement is providing increased enforcement and data in the Gulf of Mexico. Compliance with existing closed areas is improved.

The South Atlantic Council is evaluating requiring VMS in the golden crab fishery. The following information is from Golden Crab Amendment 6 (under development):

> "The South Atlantic Council selected **Preferred Alternative 2, Preferred Sub-Alternative 2c** for monitoring and enforcement. This sub-alternative is consistent with other catch share programs monitored by NOAA Fisheries Service in the Southeast Region. It relies on cost sharing, requiring the NOAA Fisheries Service to purchase the VMS hardware contingent on the National OLE VMS reimbursement account has available funds, and the permit holders will be responsible for installation, maintenance and ongoing communications costs.
>
> The Council's Golden Crab AP did not support putting VMS on the vessels; instead, the AP recommended a hail out/hail in provision. Their objection to VMS was based on the fact that VMS can only show the location of the fishing vessels, not the gear on the seafloor. Golden crab vessels set their gear close to the sensitive habitats (about ¼ to ½ mile away) and the vessels can drift into areas where their gear is not allowed after it is deployed. There was concern that fishermen would be open to violations if their vessel was in a "no fishing" area, even though their gear (on the seafloor) was in a legal location.
>
> The Council's Law Enforcement AP supported the Council's preferred sub-alternative for this action.
>
> The Council's SSC supported the idea of using VMS in the fishery, as it is informative for future stock assessments. Should there ever become localized depletion in the future, VMS data would be valuable for determining where it is occurring."

The Council has required VMS in the rock shrimp fishery since 2003 and this has been used to enforce closed areas and to collect data on area fished. Most recently, the Council is evaluating new Coral Habitat-Areas-Of-Particular-Concern and is using VMS data to determine where fishing has taken place. This allows the Council to balance socio-economic impacts on fishermen with the need to protect sensitive coral and live/hardbottom habitat.

The Snapper Grouper Advisory Panel (AP) has recommended to the Council on numerous occasions they consider a requirement to carry VMS for both recreational and commercial vessels in the South Atlantic. In April 2010, the AP approved a motion to recommend mandatory VMS for all vessels that interact with snapper grouper species in the EEZ and accountability measures that would prevent fishing in the absence

of VMS. Again, in April 2012, the SG AP approved a motion to recommend the Council require VMS for any vessel harvesting fish in South Atlantic waters.

The Council discussed this action in December 2012 and there was concern about the cost to fishermen and the fact that right now there is money in the NMFS account to reimburse fishermen and this may not be available in the future. The Council recognizes that a number of fishermen disagree with this requirement but they concluded requiring VMS would improve (1) safety at sea, (2) data collection, (3) enforcement of closed areas (MPAs), and (4) enforcement of other regulations. The Council concluded these benefits outweight the costs of requiring VMS and selected Preferred Alternative 3 that would require VMS if funding is available to reimburse fishermen. The Council also concluded thisw alternative best meets the purpose and need, the obhjectives of the snapper grouper fishery management plan, as amended, and other applicable law.

Chapter 6. Cumulative Effects

To be updated.

As directed by the National Environmental Policy Act (NEPA), federal agencies are mandated to assess not only the indirect and direct impacts, but the cumulative impacts of proposed actions as well. NEPA defines a cumulative impact as *"the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time"* (40 C.F.R. 1508.7). Cumulative effects can either be additive or synergistic. A synergistic effect is when the combined effects are greater than the sum of the individual effects.

Various approaches for assessing cumulative effects have been identified, including checklists, matrices, indices, and detailed models (MacDonald 2000). The Council on Environmental Quality (CEQ) offers guidance on conducting a Cumulative Effects Analysis (CEA) in a report titled "Considering Cumulative Effects under the National Environmental Policy Act". The report outlines 11 items for consideration in drafting a CEA for a proposed action.

1. Identify the significant cumulative effects issues associated with the proposed action and define the assessment goals.
2. Establish the geographic scope of the analysis.
3. Establish the timeframe for the analysis.
4. Identify the other actions affecting the resources, ecosystems, and human communities of concern.
5. Characterize the resources, ecosystems, and human communities identified in scoping in terms of their response to change and capacity to withstand stress.
6. Characterize the stresses affecting these resources, ecosystems, and human communities and their relation to regulatory thresholds.
7. Define a baseline condition for the resources, ecosystems, and human communities.
8. Identify the important cause-and-effect relationships between human activities and resources, ecosystems, and human communities.
9. Determine the magnitude and significance of cumulative effects.
10. Modify or add alternatives to avoid, minimize, or mitigate significant cumulative effects.
11. Monitor the cumulative effects of the selected alternative and adapt management.

This CEA for the biophysical environment will follow a modified version of the 11 steps. Cumulative effects for the socio-economic environment will be analyzed separately.

6.1 Biological

1. Identify the significant cumulative effects issues associated with the proposed action and define the assessment goals.

The Council on Environmental Quality (CEQ) cumulative effects guidance states that this step is done through three activities. The three activities and the location in the document are as follows:
I. The direct and indirect effects of the proposed actions **(Chapter 4)**;
II. Which resources, ecosystems, and human communities are affected **(Chapter 3)**; and
III. Which effects are important from a cumulative effects perspective **(information revealed in this Cumulative Effects Analysis (CEA)**

2. Establish the geographic scope of the analysis.

The immediate impact area would be the federal 200-mile limit of the Atlantic off the coasts of North Carolina, South Carolina, Georgia, and east Florida to Key West, which is also the South Atlantic Fishery Management Council's (South Atlantic Council) area of jurisdiction. In light of the available information, the extent of the boundaries would depend upon the degree of fish immigration/emigration and larval transport, whichever has the greatest geographical range. The ranges of affected species are described in **Section 3.2.1**. **Section 3.1.1** describes the essential fish habitat designation and requirements for species affected by this amendment. The most measurable and substantial effects would be limited to the South Atlantic region.

3. Establish the timeframe for the analysis.

Establishing a timeframe for the CEA is important when the past, present, and reasonably foreseeable future actions are discussed. It would be advantageous to go back to a time when there was a natural, or some modified (but ecologically sustainable) condition. However, data collection for many fisheries began when species were already fully exploited. Therefore, the timeframe for analyses should be initiated when data collection began for the various fisheries. In determining how far into the future to analyze cumulative effects, the length of the effects will depend on the species and the alternatives chosen. Long-term evaluation is needed to determine if management measures have the intended effect of improving stock status.

4. Identify the other actions affecting the resources, ecosystems, and human communities of concern (the cumulative effects to the human communities are discussed in Section 4).

Listed are other past, present, and reasonably foreseeable actions occurring in the South Atlantic region. These actions, when added to the proposed management measures, may result in cumulative effects on the biophysical environment.

I. Fishery-related actions affecting red snapper and associated species.

A. Past

The reader is referred to **Chapter 1 and Appendix F** (History of Management**)** of this document for past regulatory activity for the fish species including amendments to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP). These include bag and size limits, spawning season closures, commercial quotas, gear prohibitions and limitations, area closures, and a commercial limited access system.

Amendment 9 to the Snapper Grouper FMP (Amendment 9; SAFMC 1998) established minimum size limits for yellowtail snapper, red and black grouper, gag, yellowfin and yellowmouth grouper, and scamp; and created a 20-fish aggregate recreational bag limit for snapper grouper species without a bag limit (with the exception of tomtate and blue runner), including yellowtail snapper. The amendment also prohibited the sale and purchase of gag, red porgy and black grouper during March and April; and included gag and black grouper within the 5-fish aggregate grouper bag limit, of which no more than 2 fish could be gag or black grouper (individually or in combination). The South Atlantic Fishery Management Council (South Atlantic Council) approved Amendment 9 at their December 1998 meeting. The final rule published in the *Federal Register* on January 25, 1999, and became effective on February 24, 1999.

Amendment 14 to the Snapper Grouper FMP (Amendment 14; SAFMC 2007) was implemented on February 12, 2009. Amendment 14 established eight Type II marine protected areas (MPAs) where fishing for and retention of snapper-grouper species is prohibited (as is the use of shark bottom longlines), but trolling for pelagic species such as tuna, dolphin, and billfish is allowed. The intent was to achieve a more natural sex ratio, age, and size structure of all species within the MPAs, while minimizing adverse social and economic effects. The South Atlantic Council approved Amendment 14 at their June 2007 meeting. The final rule published in the *Federal Register* on January 13, 2009, and became effective on February 12, 2009.

Amendment 15B to the Snapper Grouper FMP (Amendment 15B; SAFMC 2008b) became effective on December 16, 2009. Management measures in Amendment 15B included a prohibition of the sale of bag limit caught snapper grouper species for fishermen not holding a federal commercial permit for South Atlantic snapper grouper; an action to adopt, when implemented, the Atlantic Coastal Cooperative Statistics Program release, discard and protected species module to assess and monitor bycatch, allocations for snowy grouper, and management reference points for golden tilefish. Biological benefits from Amendment 15B are not expected to result in a significant cumulative biological effect when added to anticipated biological impacts under this amendment. The South Atlantic Council approved Amendment 15B at their June 2008 meeting. The final rule published in the *Federal Register* on November 16, 2009, and became effective on December 16, 2009.

Amendment 17B to the Snapper Grouper FMP (Amendment 17B; SAFMC 2010b), which was implemented on January 31, 2011, established annual catch limits (ACL), annual catch targets, and accountability measures (AMs) for 8 species experiencing overfishing; modified management measures to limit total mortality to the ACL; and updated the framework procedure for specification of total allowable catch. Amendment 17B also prohibited the harvest and possession of deepwater

snapper grouper species (snowy grouper, blueline tilefish, yellowedge grouper, misty grouper, queen snapper, and silk snapper) at depths greater than 240 feet. The intent of this measure was to reduce bycatch of speckled hind and warsaw grouper. The South Atlantic Council approved Amendment 17B at their September 2010 meeting. The final rule published in the *Federal Register* on December 30, 2010.

The Comprehensive ACL Amendment (SAFMC 2011b) includes ACLs and AMs for federally managed species not undergoing overfishing in four FMPs (Snapper Grouper, Dolphin Wahoo, Golden Crab, and *Sargassum*). Actions contained within the Comprehensive ACL Amendment include: (1) Removal of species from the snapper grouper fishery management unit; (2) designation of ecosystem component species; (3) allocations; (4) management measures to limit recreational and commercial sectors to their ACLs; (5) AMs; and (6) any necessary modifications to the range of regulations. The South Atlantic Council approved the Comprehensive ACL Amendment in September 2011. The final rule published in the *Federal Register* on March 16, 2012, and became effective on April 16, 2012.

Regulatory Amendment 11 to the Snapper Grouper FMP (Regulatory Amendment 11; SAFMC 2011c) was approved by the South Atlantic Council at their August 9, 2011, meeting. The amendment implemented regulations to remove the deepwater closure beyond 240 ft for six deepwater snapper grouper species that was approved in Amendment 17B. The South Atlantic Council approved Regulatory Amendment 11 at their August 2011 meeting. The final rule published in the *Federal Register* on May 12, 2012, and became effective on the same day.

Amendment 18A to the Snapper Grouper FMP (Amendment 18A; SAFMC 2011d) contains measures to limit participation and effort for black sea bass. Amendment 18A established an endorsement program than enables snapper grouper fishermen with a certain catch history to harvest black sea bass with pots. In addition, Amendment 18A included measures to reduce bycatch in the black sea bass pot fishery, modified the rebuilding strategy, and other necessary changes to management of black sea bass as a result of a 2011 stock assessment. The South Atlantic Council approved Amendment 18A in December 2011. The amendment was partially approved and the final rule published in the *Federal Register* on June 1, 2012, and became effective on July 1, 2012.

Amendment 24 to the Snapper Grouper FMP (Amendment 24; SAFMC 2011e) implemented a rebuilding plan for red grouper, which is overfished and undergoing overfishing. The South Atlantic Council approved Amendment 24 in December 2011. The final rule published in the *Federal Register* on June 11, 2012, and became effective on July 11, 2012.

Amendment 20A to the Snapper Grouper FMP (Amendment 20A; SAFMC 2011g) would distribute shares from inactive participants in the wreckfish individual transferable quota (ITQ) to active shareholders. The South Atlantic Council approved Amendment 20A in December 2011. The final rule for Amendment 20A published in the *Federal Register* on September 26, 2012, and became effective on October 26, 2012.

Regulatory Amendment 12 to the Snapper Grouper FMP (Regulatory Amendment 12; SAFMC 2012a) includes alternatives to adjust the golden tilefish ACL based on the results of a new assessment, which indicates golden tilefish are no longer experiencing overfishing and are not overfished. Regulatory Amendment 12 also includes an action to adjust the recreational AM.

Regulatory Amendment 12 was approved for submission to the Secretary of Commerce by the South Atlantic Council at their March 2012 meeting. The Final Rule published in the *Federal Register* on October 9, 2012 and was effective upon publication.

In a letter dated June 19, 2012, the South Atlantic Council requested NMFS to allow harvest and possession of red snapper in 2012 through emergency regulations. At their June 11-15, 2012, meeting, the South Atlantic Council reviewed new information in the form of red snapper rebuilding projections, 2012 acceptable biological catch levels, and 2012 discard mortality levels. After accounting for the 2012 discard mortalities, the South Atlantic Council determined that directed harvest could be allowed without compromising the rebuilding of the stock to target levels. The *Federal Register* announced the opening of the 2012 commercial and recreational red snapper fishing season in South Atlantic federal waters on August 28, 2012. The commercial red snapper season opened at 12:01 a.m., local time, on September 17, 2012, and closed at 12:01 a.m., local time, on September 24, 2012. . Because the commercial ACL was not met, commercial harvest of red snapper reopened for 8 days beginning November 13, 2012, and for 7 days beginning December 6, 2012. During the open commercial season, the daily trip limit was 50 lbs gw and there was no minimum size limit for red snapper. The recreational fishing season opened for two consecutive weekends made up of Fridays, Saturdays, and Sundays. The recreational red snapper season opened at 12:01 a.m., local time, on September 14, 2012, and closed at 12:01 a.m., local time, on September 17, 2012; the season then reopened at 12:01 a.m., local time, on September 21, 2012, and closed at 12:01 a.m., local time, on September 24, 2012. During the open recreational season, the bag limit was one fish per person per day and there was no minimum size limit for red snapper.

B. Present

In addition to snapper grouper fishery management issues being addressed in this amendment, several other snapper grouper amendments have been developed concurrently and are in the process of approval and implementation. Not all of these amendments directly affect the species in this amendment.

The South Atlantic Council has recently completed and is developing amendments for coastal migratory pelagic species, golden crab, dolphin-wahoo, shrimp, and corals/live-hard bottom. See the South Atlantic Council's Web site at http://www.safmc.net/ for further information on South Atlantic Council managed species.

C. Reasonably Foreseeable Future

Amendment 20B to the Snapper Grouper FMP is currently under development. The amendment will include a formal review of the current wreckfish individual transferable quota (ITQ) program, and will update/modify that program according to recommendations gleaned from the review.

Amendment 18B to the Snapper Grouper FMP was approved by the South Atlantic Council at their June 2012 meeting and considers alternatives addressing golden tilefish. Regulations are expected to be implemented in early 2013. Specifically, actions could establish initial eligibility requirements and address trip limits for a golden tilefish longline endorsement program, allocate golden tilefish quota among gear groups, adjust the golden tilefish fishing year, and establish an appeals process.

At their June 2012 meeting, the South Atlantic Council further discussed Amendment 22 to the Snapper Grouper FMP to consider measures such as a tagging program to allow harvest of red snapper as the stock rebuilds. Scoping of Amendment 22 was conducted during January and February 2011. At their September 2012 meeting, the South Atlantic Council stated their intent to further develop Amendment 22 in 2013 focusing on a recreational tag program for red snapper, golden tilefish, snowy grouper and wreckfish.

At their December 2012 meeting, the South Atlantic Council approved Regulatory Amendment 13 to allow for adjustment of allocations, ACLs, ACTs for select non-assessed snapper grouper sepcies based on the new landings information from the Marine Recreational Information Program.

At their June 2012 meeting the South Atlantic Council requested development of a regulatory amendment to adjust management measures for greater amberjack, vermilion snapper, black sea bass, gray triggerfish, vermilion snapper, hogfish, and red porgy. This amendment will be further developed in 2013.

Regulatory Amendment 15, approved by the South Atalntic Council at their December meeting, would implement a revised ACL for yellowtail snapper based on the latest stock assessment and modify a gag AM and ACL.

The History of Management, **Appendix F**, includes various other amendments in development.

II. Non-Council and other non-fishery related actions, including natural events affecting the species in this amendment

A. Past
B. Present
C. Reasonably foreseeable future

In terms of natural disturbances, it is difficult to determine the effect of non-Council and non-fishery related actions on stocks of snapper grouper species. Annual variability in natural conditions such as water temperature, currents, food availability, predator abundance, etc. can affect the abundance of young fish which survive the egg and larval stages each year to become juveniles (i.e., recruitment). This natural variability in year class strength is difficult to predict as it is a function of many interactive and synergistic factors that cannot all be measured (Rothschild 1986). Furthermore, natural factors such as storms, red tide, cold water upwelling, etc. can affect the survival of juvenile and adult fishes; however, it is very difficult to quantify the magnitude of mortality these factors may have on a stock. Alteration of preferred habitats for snapper grouper species could affect survival of fish at any stage in their life cycles. However, estimates of the abundance of fish, which utilize any number of preferred habitats, as well as, determining the impact habitat alteration may have on snapper grouper species, is problematic.

The snapper grouper ecosystem includes many species which occupy the same habitat at the same time. For example, red snapper co-occur with vermilion snapper, tomtate, scup, red porgy, white grunt, black sea bass, red grouper, scamp, gag, and others. Therefore, red snapper are likely to be caught and suffer some mortality since they will be incidentally caught when fishermen target other co-occurring species. Red snapper recruitment has been measured from the 1950s to the

present time and shows a decline from the earliest years to a low in the mid-1900s. Since then there have been several moderately good year classes in 1998, 1999, and 2000, and then another decline through 2003, with an apparent strong year class occurring in 2006. These moderately good year classes have grown and entered the fishery over the past couple years and are likely responsible for the higher catches being reported by recreational and commercial fishermen. Other natural events such as spawning seasons, and aggregations of fish in spawning condition can make some species especially vulnerable to targeted fishing pressure. Such natural behaviors are discussed in further detail in **Chapter 3** of this document, which is hereby incorporated by reference.

How global climate changes will affect the red snapper component of the snapper grouper fishery is unclear. Climate change can impact marine ecosystems through ocean warming by increased thermal stratification, reduced upwelling, sea level rise, increases in wave height and frequency, loss of sea ice, and increased risk of diseases in marine biota. Decreases in surface ocean pH due to absorption of anthropogenic CO_2 emissions may impact a wide range of organisms and ecosystems, particularly organism that absorb calcium from surface waters, such as corals and crustaceans (IPCC 2007, and references therein).

The BP/Deepwater Horizon oil spill event, which occurred in the Gulf of Mexico on April 20, 2010, did not impact fisheries operating the South Atlantic. Oil from the spill site has not been detected in the South Atlantic region, and did not likely to pose a threat to the species addressed in this amendment.

5. Characterize the resources, ecosystems, and human communities identified in scoping in terms of their response to change and capacity to withstand stress.

In terms of the biophysical environment, the resources/ecosystems identified in earlier steps of the CEA are the fish populations directly or indirectly affected by the regulations. This step should identify the trends, existing conditions, and the ability to withstand stresses of the environmental components.

The species most likely to be impacted by alternatives considered in this regulatory amendment are yellowtail snapper, gag, and other shallow-water groupers (red grouper, black grouper, scamp, red hind, rock hind, yellowmouth grouper, yellowfin grouper, coney, and graysby). Trends in the condition of these species are determined through the Southeast Data, Assessment and Review (SEDAR) process. More information on the SEDAR process can be found in **Section 3.2.3** whereas specific information on the assessed species (yellowtail snapper, gag, red grouper and black grouper) can be found in **Section 3.2.1**, and is herby incorporated by reference.

6. Characterize the stresses affecting these resources, ecosystems, and human communities and their relation to regulatory thresholds.

This step is important in outlining the current and probable stress factors on snapper grouper species identified in the previous steps. The goal is to determine whether these species are approaching conditions where additional stresses could have an important cumulative effect beyond any current plan, regulatory, or sustainability threshold (CEQ 1997). Sustainability thresholds can be identified for some resources, which are levels of impact beyond which the resources cannot be sustained in a stable state. Other thresholds are established through numerical standards, qualitative standards, or management goals. The CEA should address whether thresholds could be exceeded because of the contribution of the proposed action to other cumulative activities affecting resources.

Fish populations

Numeric values of overfishing and overfished thresholds were updated in Amendment 17A for red snapper. These values includes maximum sustainable yield (MSY), the fishing mortality rate that produces MSY (F_{MSY}), the biomass or biomass proxy that supports MSY (B_{MSY}), the minimum stock size threshold below which a stock is considered to be overfished (MSST), the maximum fishing mortality threshold above which a stock is considered to be undergoing overfishing (MFMT), and optimum yield (OY).

Definitions of overfishing and overfished for red snapper can be found in the most recent stock assessment sources included in **Table 3.1** of this document. Applicable stock assessment sources for red snapper include SEDAR 24 (2010) and SEDAR 15 (2008), both of which determined the red snapper stock to be undergoing overfishing and overfished.

Climate change

Global climate changes could have significant effects on South Atlantic fisheries. However, the extent of these effects is not known at this time. Possible impacts include temperature changes in coastal and marine ecosystems that can influence organism metabolism and alter ecological processes such as productivity and species interactions; changes in precipitation patterns and a rise in sea level which could change the water balance of coastal ecosystems; altering patterns of wind and water circulation in the ocean environment; and influencing the productivity of critical coastal ecosystems such as wetlands, estuaries, and coral reefs (IPCC 2007; Kennedy et al. 2002).

It is unclear how climate change would affect snapper grouper species in the South Atlantic. Climate change can affect factors such as migration, range, larval and juvenile survival, prey availability, and susceptibility to predators. In addition, the distribution of native and exotic species may change with increased water temperature, as may the prevalence of disease in keystone animals such as corals and the occurrence and intensity of toxic algae blooms. Climate change may significantly impact snapper grouper species in the future, but the level of impacts cannot be quantified at this time, nor is the time frame known in which these impacts will occur.

7. Define a baseline condition for the resources, ecosystems, and human communities.

The purpose of defining a baseline condition for the resource and ecosystems in the area of the proposed action is to establish a point of reference for evaluating the extent and significance of expected cumulative effects. The SEDAR assessments show trends in biomass, fishing mortality, fish weight, and fish length going back to the earliest periods of data collection. For some species such as snowy grouper, assessments reflect initial periods when the stock was above B_{MSY} and fishing mortality was fairly low. However, some species were heavily exploited or possibly overfished when data were first collected. As a result, the assessment must make an assumption of the biomass at the start of the assessment period thus modeling the baseline reference points for the species.

For a detailed discussion of the baseline conditions of the species addressed in this amendment that have undergone stock assessments (yellowtail snapper, gag, red grouper, and black grouper), the reader is referred to the sources referenced in **Item Number 6** of this CEA.

8. Identify the important cause-and-effect relationships between human activities and resources, ecosystems, and human communities.

The snapper grouper fishery is a highly regulated fishery; the regulations have affected the resource, ecosystem, and human communities **(Table 6-1).**

Table 6-1. The cause and effect relationship of fishing and regulatory actions within the time period of the Cumulative Effects Analysis (CEA).

Time period/dates	Cause	Observed and/or Expected Effects
Pre-January 12, 1989	Habitat destruction, growth overfishing of vermilion snapper.	Damage to snapper grouper habitat, decreased yield per recruit of vermilion snapper.
January 1989	Trawl prohibition to harvest fish (SAFMC 1988).	Increase yield per recruit of vermilion snapper; eliminate trawl damage to live bottom habitat.
Pre-January 1, 1992	Overfishing of many snapper grouper species.	Spawning stock ratio of these species is estimated to be less than 30% indicating that they are overfished.
January 1992	Prohibited gear: fish traps south of Cape Canaveral, FL; entanglement nets; longline gear inside of 50 fathoms; powerheads and bangsticks in designated SMZs off SC. Size/Bag limits: 10" TL vermilion snapper (recreational only); 12" TL vermilion snapper (commercial only); 10 vermilion snapper/person/day; aggregate grouper bag limit of 5/person/day; and 20" TL gag, red, black, scamp, yellowfin, and yellowmouth grouper size limit (SAFMC 1991).	Reduce mortality of snapper grouper species.
Pre-June 27, 1994	Damage to *Oculina* habitat.	Noticeable decrease in numbers and species diversity in areas of *Oculina* off

Time period/dates	Cause	Observed and/or Expected Effects
		FL
July 1994	Prohibition of fishing for and retention of snapper grouper species (HAPC renamed OECA; SAFMC 1993)	Initiated the recovery of snapper grouper species in OECA.
1992-1999	Declining trends in biomass and overfishing continue for a number of snapper grouper species including golden tilefish.	Spawning potential ratio for golden tilefish is less than 30% indicating that they are overfished.
July 1994	Commercial quota for golden tilefish; commercial trip limits for golden tilefish; include golden tilefish in grouper recreational aggregate bag limits.	
February 24, 1999	All S-G without a bag limit: aggregate recreational bag limit 20 fish/person/day, excluding tomtate and blue runners. Vessels with longline gear aboard may only possess snowy, Warsaw, yellowedge, and misty grouper, and golden, blueline and sand tilefish.	
Effective October 23, 2006	Snapper grouper FMP Amendment 13C (SAFMC 2006)	Commercial vermilion snapper quota set at 1.1 million lbs gw; recreational vermilion snapper size limit increased to 12" TL to prevent vermilion snapper overfishing.
Effective February 12, 2009	Snapper grouper FMP Amendment 14 (SAFMC 2007)	Use marine protected areas (MPAs) as a management tool to promote the optimum size, age, and genetic structure of slow growing, long-lived deepwater snapper grouper species (e.g., speckled hind, snowy grouper, warsaw grouper, yellowedge grouper, misty grouper, golden tilefish, blueline tilefish, and sand tilefish). Gag and vermilion snapper occur in some of these areas.
Effective March 20, 2008	Snapper grouper FMP Amendment 15A (SAFMC 2008a)	Establish rebuilding plans and SFA parameters for snowy grouper, black sea bass, and red porgy.
Effective Dates Dec 16, 2009, to Feb 16, 2010.	Snapper grouper FMP Amendment 15B (SAFMC 2008b)	End double counting in the commercial and recreational reporting systems by prohibiting the sale of bag-limit caught snapper grouper, and minimize impacts on sea turtles and smalltooth sawfish.
Effective Date July 29, 2009	Snapper grouper FMP Amendment 16 (SAFMC 2009a)	Protect spawning aggregations and snapper grouper in spawning condition by increasing the length of the spawning season closure, decrease discard mortality by requiring the use of dehooking tools, reduce overall harvest of gag and vermilion snapper to

Time period/dates	Cause	Observed and/or Expected Effects
		end overfishing.
Effective Date January 4, 2010	Red Snapper Interim Rule	Prohibit commercial and recreational harvest of red snapper from January 4, 2010, to June 2, 2010 with a possible 186-day extension. Reduce overfishing of red snapper while long-term measures to end overfishing are addressed in Amendment 17A.
Effective Dates June 3, 2010, to Dec 5, 2010	Extension of Red Snapper Interim Rule	Extended the prohibition of red snapper to reduce overfishing of red snapper while long-term measures to end overfishing are addressed in Amendment 17A.
Effective Date December 4, 2010	Snapper Grouper FMP Amendment 17A (SAFMC 2010a).	Specified SFA parameters for red snapper; ACLs and ACTs; management measures to limit recreational and commercial sectors to their ACTs; accountability measures. Establish rebuilding plan for red snapper. Large snapper grouper area closure inn EEZ of NE Florida. Emergency rule delayed the effective date of the snapper grouper closure.
Effective Date January 31, 2011	Snapper Grouper Amendment 17B (SAFMC 2010b)	Specified ACLs and ACTs; management measures to limit recreational and commercial sectors to their ACTs; AMs, for species undergoing overfishing. Established a harvest prohibition of six snapper grouper species in depths greater than 240 feet.
Effective Date June 1, 2011	Regulatory Amendment 10 (SAFMC 2011a)	Removed of snapper grouper area closure approved in Amendment 17A.
Effective Date July 15, 2011	Regulatory Amendment 9 (SAFMC 2011h)	Harvest management measures for black sea bass; commercial trip limits for gag, vermilion and greater amberjack
Effective Date May 10, 2012	Regulatory Amendment 11 (SAFMC 2011c)	Removed the harvest prohibition of six deepwater snapper grouper species implemented in Amendment 17B.
Effective Date April 16, 2012	Comprehensive ACL Amendment (SAFMC 2011b)	ACLs ACTs, and AMs for species not experiencing overfishing; accountability measures; an action to remove species from the fishery management unit as appropriate; and management measures to limit recreational and commercial sectors to their ACTs.

Time period/dates	Cause	Observed and/or Expected Effects
July 11, 2012	Amendment 24 (Red Grouper) (SAFMC 2011e)	Established a rebuilding plan for red grouper, specified ABC, and established ACL, ACT and revised AMs for the commercial and recreational sectors.
Effective Date July 1, 2012	Amendment 18A (SAFMC 2012b)	Established an endorsement program for black sea bass commercial fishery; established a trip limit; specified requirements for deployment and retrieval of pots; made improvements to data reporting for commercial and for-hire sectors
Effective Dates: September 17, 2012 (commercial); September 14, 2012 (recreational)	Temporary Rule through Emergency Action (Red snapper)	Established limited red snapper fishing seasons (commercial and recreational) in 2012.
Effective Date January 7, 2013	Amendment 18A Transferability Amendment	Reconsidered action to allow for transfer of black sea bass pot endorsements that was disapproved in Amendment 18A.
Effective Date October 26, 2012	Amendment 20A (Wreckfish) (SAFMC 2012g)	Redistributed inactive wreckfish shares.
Effective Date October 9, 2012	Regulatory Amendment 12 (SAFMC 2012a)	Adjusted the golden tilefish ACL based on the results of a new stock assessment and modified the recreational golden tilefish AM.
Target 2013	Snapper Grouper Amendment 18B (under review, SAFMC 2012c)	Establish a commercial longline endorsement program for golden tilefish; establish an appeals process; allocate the commercial ACL by gear; establish trip limit for the hook and line sector
Target 2013	Snapper Grouper Amendment 22 (under development)	Develop a recreational tag program for red snapper and deepwater species (snowy grouper, golden tilefish and wreckfish) in the South Atlantic.
Target 2013	Regulatory Amendment 13 (under development)	Adjust ACLs and allocations for unassessed snapper grouper species with MRIP recreational estimates
Target 2013	Snapper Grouper Amendment 27 (under development)	Establish the SAFMC as the managing entity for yellowtail and mutton snappers and Nassau grouper in the Southeast U.S., modify the SG framework; modify placement of blue runner in an FMU or modify management measures for blue runner
Target 2013	Snapper Grouper Amendment 28 (under development)	Modify red snapper management measures, including the establishment of a process to determine future annual catch limits and fishing seasons.

9. Determine the magnitude and significance of cumulative effects.

When species in the snapper grouper fishery management unit are assessed, stock status may change as new information becomes available. In addition, changes in management regulations, fishing techniques, social/economic structure, etc. can result in shifts in the percentage of harvest between user groups over time. As such, the South Atlantic Council has determined that certain aspects of the current management system should be restructured. **Chapters 2** and **4** of this document--which considers a procedure for determining a red snapper ACL, alternatives for a fishing season, and management measures during the fishing season--describe in detail the magnitude and significance of effects of the alternatives considered.

The proposed action would not adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places as these are not in the South Atlantic Exclusive Economic Zone (EEZ). This action is not likely to result in direct, indirect, or cumulative effects to unique areas, such as significant scientific cultural, or historical resources, park land, prime farmlands, wetlands, wild and scenic rivers or ecologically critical areas as the proposed action is not expected to substantially increase fishing effort or the spatial and/or temporal distribution of current fishing effort within the South Atlantic region. The U.S. Monitor, Gray's Reef, and Florida Keys National Marine Sanctuaries are within the boundaries of the South Atlantic EEZ. The proposed actions are not likely to cause loss or destruction of these national marine sanctuaries because the actions, which may establish a short opening for red snapper in the future, are not expected to result in appreciable changes to current fishing practices.

10. Modify or add alternatives to avoid, minimize, or mitigate significant cumulative effects.

The cumulative effects on the biophysical environment are expected to be negligible. Avoidance, minimization, and mitigation are not applicable.

11. Monitor the cumulative effects of the selected alternative and adopt management.

The effects of the proposed actions are, and will continue to be, monitored through collection of data by NMFS, states, stock assessments and stock assessment updates, life history studies, and other scientific observations.

6.2 Socioeconomic

The decision to allow for the harvest of red snapper in South Atlantic waters is likely to have positive social effects, as the closure of this fishery was highly controversial. Public comment suggested that there were more red snapper than what was reflected in the stock assessment science. The temporary opening, as a result of lower discards, was likely perceived positively and may have had positive economic and social effects. However, the uncertainty that comes from temporary openings and closures does not have positive social effects in the long term. A more permanent management regime is always more acceptable to stakeholders and would likely be seen as

responsive to stakeholder concerns. With the establishment of an ACL, commercial fishermen may be able to keep more red snapper that might be discarded otherwise and increased commerce for for-hire fishers and associated businesses may continue. Alternatives to limit the red snapper portion of the snapper grouper fishery are also an attempt to lengthen the fishing season, like alternatives that remove the size limit and establish a commercial trip limit and recreational bag limit. Because the ACL is small, the social effects are affected by the ability of alternatives to establish a fishing season with the longest opening possible. With the establishment of the longest possible fishing season with the largest amount of fish, the social effects should be positive and beneficial in the long term. If an ACL is established and derby fishing occurs which shortens the season and there is an increase in regulatory discards, then the perceived social benefits would not accrue and could be negative in contrast.

Because of the recent overall downturn in the economy, any actions to provide more economic opportunity should have beneficial social effects. The commercial and for-hire sectors of the snapper grouper fishery have seen significant changes in regulatory actions with limited entry and attempts to pursue other types of management that may seem too restrictive (e.g., IFQs). With the recent adoption of annual catch limits, early closures of some fisheries are occurring which can change fishing behavior by initiating switching target behavior to other fisheries and adding pressure on other stocks. If those choices are limited, then fishermen are also limited in their flexibility to adapt to regulatory change. Without other options on the water, they may need to make changes in household economics that can have further impacts that extend to the larger community. Much of this discussion is based upon assumption as we do not have enough detailed information on fishermen's businesses or households.

Chapter 7. List of Preparers

Table 7-1. List of preparers of the document.

Name	SAFMC	Title
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NMFS = National Marine Fisheries Service, SAFMC = South Atlantic Fishery Management Council, SF = Sustainable Fisheries Division, PR = Protected Resources Division, SERO = Southeast Regional Office, HC = Habitat Conservation Division, GC = General Counsel, Eco=Economics

Table 7-2. List of interdisciplinary plan team members for the document.

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NMFS = National Marine Fisheries Service, SAFMC = South Atlantic Fishery Management Council, SF = Sustainable Fisheries Division, PR = Protected Resources Division, SERO = Southeast Regional Office, HC = Habitat Conservation Division, GC = General Counsel, Eco=Economics

Chapter 8. Agencies and Persons Consulted

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List of Agencies, Organizations, and Persons Consulted
SAFMC Law Enforcement Advisory Panel
SAFMC Snapper Grouper Advisory Panel
SAFMC Scientific and Statistical Committee
SAFMC Information and Education Advisory Panel
North Carolina Coastal Zone Management Program
South Carolina Coastal Zone Management Program
Georgia Coastal Zone Management Program
Florida Coastal Zone Management Program
Florida Fish and Wildlife Conservation Commission
Georgia Department of Natural Resources
South Carolina Department of Natural Resources
North Carolina Division of Marine Fisheries
North Carolina Sea Grant
South Carolina Sea Grant
Georgia Sea Grant
Florida Sea Grant
Atlantic States Marine Fisheries Commission
Gulf and South Atlantic Fisheries Development Foundation
Gulf of Mexico Fishery Management Council
National Marine Fisheries Service
- Washington Office
- Office of Ecology and Conservation
- Southeast Regional Office
- Southeast Fisheries Science Center

Chapter 9. References

To be completed