Regulatory Amendment 30 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region

Rebuilding schedule, seasonal prohibition, and commercial trip limit for red grouper

Environmental Assessment Regulatory Impact Review Regulatory Flexibility Act Analysis

DRAFT August 27, 2018

Definitions, Abbreviations, and Acronyms Used in the Document

ABC acceptable biological catch

ACL annual catch limits

ACT annual catch target

ALS Accumulated Landings System

AM accountability measures

ASFMC Atlantic States Marine Fisheries Commission

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_{CURR} the current stock biomass

COUNCIL South Atlantic Fishery Management Council

CS consumer surplus

DPS distinct population segment

EEZ exclusive economic zone

EFH essential fish habitat

EFH-HAPC essential fish habitat-habitat areas of particular concern

ESA Endangered Species Act

F a measure of the instantaneous rate of fishing mortality

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}

FMP fishery management plan

FMU fishery management unit

LB GW pounds gutted weight

LB WW pounds whole weight

M natural mortality rate

MAGNUSON-STEVENS ACT Magnuson Stevens Fishery Conservation and Management Act

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

NARW North Atlantic Right Whale

NEPA National Environmental Policy Act

NMFS National Marine Fisheries Service

NMI nautical miles

NOAA National Oceanic and Atmospheric Administration

NOR net operating revenue

OY optimum yield

PS producer surplus

RIR regulatory impact review

SECRETARY Secretary of Commerce

SEDAR Southeast Data, Assessment, and Review

SEFSC Southeast Fisheries Science Center

SERO Southeast Regional Office

SMZ special management zone

SOUTH ATLANTIC southeastern united states

SPR spawning potential ratio

SSB stock spawning biomass

SSC Scientific and Statistical Committee

TAC total allowable catch

Regulatory Amendment 30 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region

Including Environmental Assessment, Regulatory Impact Review, and Regulatory Flexibility Act Analysis

Proposed actions: RebuildingRebuildingRebuildingRevision to rebuilding schedule, modification to the seasonal prohibition on recreational and commercial harvest off North and South Carolina, and establishment of a commercial trip limit for red grouper.

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Chapter 1. Introduction

1.1 What Actions Are Being Proposed?

Fishery managers are proposing changes to South Atlantic red grouper regulations through Regulatory Amendment 30 (Regulatory Amendment 30) to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP). Regulatory Amendment 30 would revise the rebuilding schedule for red grouper based on the most recent stock assessment and modify the spawning season closure of red grouper for the commercial and recreational sectors in the Exclusive Economic Zone (EEZ) off North and South Carolina. Regulatory Amendment 30 also includes an action to establish a commercial trip limit for red grouper harvested in the South Atlantic EEZ).

1.2 Who is Proposing the Actions?

The South Atlantic Fishery Management Council (South Atlantic Council) is responsible for managing fish stocks in the South Atlantic Region. The South Atlantic Council develops the framework amendment and sends it to the National Marine Fisheries Service (NMFS) who publishes a rule to implement the amendment on behalf of the Secretary of Commerce through rulemaking. NMFS is an agency of the National Oceanic and Atmospheric Administration (NOAA) within the Department of Commerce. Guided by the Magnuson-Stevens Fishery Conservation and Management Act, the South Atlantic Council works with NMFS and other partners and stakeholders to assess and predict the status of fish stocks, establish annual catch limits, reduce bycatch, and ensure compliance with fisheries regulations.

South Atlantic Fishery Management Council (Council)

- Responsible for conservation and management of fish stocks by developing fishery management plans and amendments under the Magnuson-Stevens Act and 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.
- 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.

Visit the Council website at http://safmc.net/

The South Atlantic Council and NMFS are also responsible for making this document available for public comment. The draft environmental assessment (EA) will be made available to the public during the scoping process, public hearings, and in South Atlantic Council meeting briefing books. The final EA/amendment will be published for public comment during the proposed rule stages of the rulemaking

process. The final EA/amendment may be found online at: XX and on the South Atlantic Council's website at http://www.safmc.net.

1.3 Where is Red Grouper Managed?

Management of the federal snapper grouper fishery located off the southeastern United States (South Atlantic) in the 3-200 nautical miles U.S. EEZ is conducted under the Snapper Grouper FMP, (SAFMC 1983) (**Figure 1.1**). Red grouper is one of fifty-five species managed by the South Atlantic Council under the Snapper Grouper FMP.

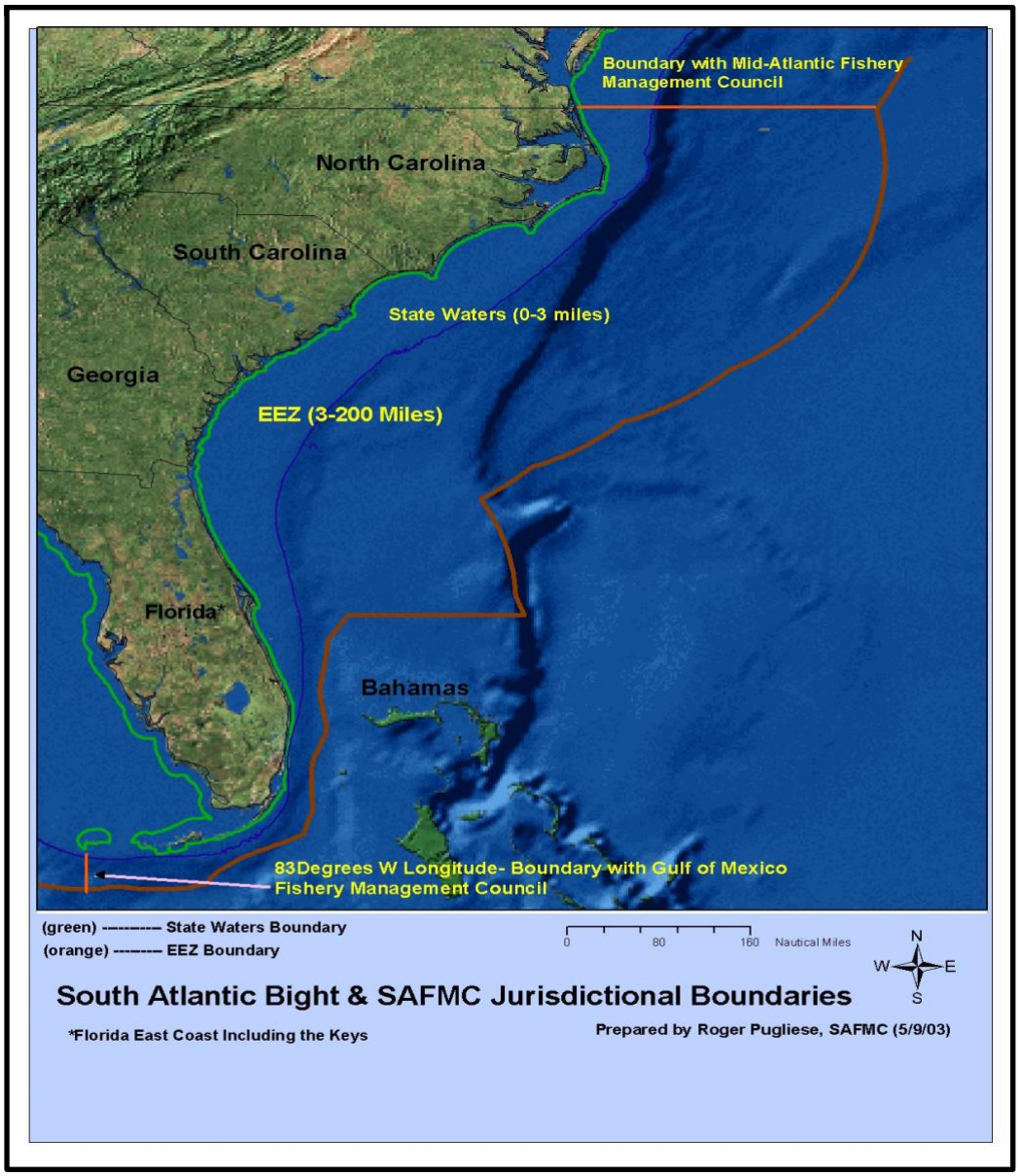

Figure 1.3.1. Jurisdictional boundaries of the South Atlantic Fishery Management Council.

Purpose for Action

The *purpose* of this amendment is to modify the rebuilding schedule for red grouper based on the results of the most recent stock assessment; minimize regulatory discards; and extend protection for red grouper during the spawning season.

Need for Action

The *need* of this amendment is to ~~end overfishing and~~ rebuild the red grouper stock; and achieve optimum yield while minimizing, to the extent practicable, adverse social and economic effects.

1.4 Why is the South Atlantic Council Considering Action (Purpose and Need)?

In 2010, a Southeast Data, Assessment, and Review benchmark assessment (SEDAR 19) was completed for South Atlantic red grouper. Based on the results of SEDAR 19, NMFS determined that red grouper was undergoing overfishing (fish are being removed too quickly from the population) and was overfished (the number of fish in the water is too low). In response, the South Atlantic Council developed, and NMFS implemented, management measures to end overfishing of red grouper through Amendment 24 to the Snapper Grouper FMP (SAFMC 2011). Fishery managers also implemented a 10-year rebuilding plan that began in 2011, with a projected end date of 2020. Amendment 24 also set the ACL equal to the acceptable biological catch (ABC) recommended by the South Atlantic Council's Scientific and Statistical Committee (SSC).

The status of the red grouper stock in the South Atlantic was updated in February 2017, with data through 2015, that indicated the stock was overfished and undergoing overfishing (SEDAR 53). On September 27, 2017, the South Atlantic Council received a letter from NMFS stating that red grouper were overfished, undergoing overfishing, and not making adequate rebuilding progress (**Appendix B**). See **Sections 3.2.1** and **Appendix C** for more information on the red grouper stock status. The Magnuson-Stevens Act requires the implementation of measures such to end overfishing immediately and revise or implement a rebuilding plan within two years of notification. The South Atlantic Council developed Abbreviated Framework Amendment 1 (SAFMC 2017) to the Snapper Grouper FMP to end overfishing of red grouper immediately through a revised ACL based on the ABC recommendation from the South Atlantic Council's SSC, with the final rule to implement the framework actions effective August 27, 2018 (83 FR 35437; July 26, 2018). However, the rebuilding plan needs to be revised to reflect the determination that the stock is not projected to rebuild by 2020. Therefore, a rebuilding plan for red grouper in the South Atlantic must be in place by September 27, 2019. The South Atlantic Council began development of Regulatory Amendment 30 to update the rebuilding schedule for red grouper and adjust management measures for that portion of the snapper grouper fishery.

1.5 What is a Rebuilding Plan and a Rebuilding Schedule?

When a stock is undergoing overfishing, fishery managers must implement management measures to end overfishing. A *rebuilding plan* is required when a stock has been declared to be in an overfished state. A stock is overfished when the biomass is below an identified minimum stock size threshold (the biomass level below which a stock would be considered overfished). The South Atlantic Council must specify a rebuilding plan since red grouper is overfished, and undergoing overfishing, as determined by the most recent stock assessment (SEDAR 53, 2017). One component of the rebuilding plan is a determination of the number of years it will take to rebuild the stock, called a *rebuilding schedule*. The Magnuson-Stevens Act mandates the maximum amount of time to rebuild a stock as 10 years. If the stock cannot be rebuilt in 10 years then the maximum allowable rebuilding time is 10 years plus one generation. Through Regulatory Amendment 30, the South Atlantic Council is considering a range of 6-10 years to rebuild red grouper. Another component of the rebuilding plan is the *rebuilding strategy*, which defines the maximum fishing mortality rate throughout the rebuilding timeframe

1.6 What is the History of Management for Red Grouper

The Council and NMFS first implemented regulations affecting red grouper in the South Atlantic Region in 1983 (**Table 1.5.1)**. See **Appendix D** for a detailed history of management of the Snapper Grouper FMP.

Table 1.5.1. History of management for red grouper in the South Atlantic Region from 1983-2017.

Description of Action	FMP/Amendment	Effective Date
Establish a 12" total length minimum size limit for red grouper; Established a 4" trawl mesh size.	Original FMP	8/31/83
Prohibit fish traps, entanglement nets & longlines within 50 fathoms; defined overfishing/overfished and established rebuilding timeframe: groupers ≤ 15 years (year 1 = 1991); aggregate bag limit of 5 groupers per person per day excluding Nassau and goliath grouper; Red grouper 20" TL commercial and recreational minimum size limit	Amendment 4 (SAFMC 1991)	1/1/92
Within the 5 fish aggregate grouper bag limit, no more than 2 fish may be gag or black grouper (individually or in combination); black grouper (recreational and commercial): no harvest or possession > bag limit, and no purchase or sale during March and April; vessels with longlines may only possess deepwater species, Specified 20 " minimum size limit for red grouper.	Amendment 9 (SAFMC 1998a)	2/24/99
MSY proxy for red grouper is 30% static SPR; OY proxy is 45% static SPR; Overfishing level = F>F30% static SPR. Approved definitions for overfished and overfishing. MSST = [(1-M) or 0.5 whichever is greater]*B_{MSY}. MFMT = F_{MSY}.	Amendment 11 (SAFMC 1998c)	12/2/99

Description of Action	FMP/Amendment	Effective Date
Reduced the 5 aggregate grouper bag limit to 3; recreational and commercial shallow water grouper spawning closure January through April; captain and crew on for-hire trips cannot retain the bag limit of vermilion snapper and species within the 3-fish grouper aggregate; Reduce the 2 gag/black bag (individually or in combination) bag limit from 2 to 1; when gag quota met, prohibit harvest of, possession, and retention of shallow water groupers (which includes red grouper)	Amendment 16 (SAFMC 2009)	7/29/09
Specified AMs for red grouper: of overfished and sector ACL is met or projected to be met, prohibit harvest and retention. If ACL exceeded, independent of stock status, reduce sector ACL in the following fishing season by amount of overage. Rec ACL compared to rec landings using only 2010 landings for 2010, an average of 2010 and 2011 for 2011, and a 3-year running average for 2012 and beyond; established aggregate ACLs (commercial and recreational) for gag, back grouper and red grouper; prohibited commercial possession of shallow water groupers (incl. red grouper) when gag ACL or aggregate (gag, black and red) is met or projected to be met.	Amendment 17B (SAFMC 2010b)	1/30/11
Established ABC control rules, establish ABCs, ACLs, and AMs for species not undergoing overfishing; removed some species from South Atlantic FMU and designate others as ecosystem component species; specified allocations between the commercial and, recreational sectors for species not undergoing overfishing; limited the total mortality for federally managed species in the South Atlantic to the ACLs.	Amendment 25 (Comprehensive ACL Amendment) (SAFMC 2011a)	4/16/12
Implemented benchmarks from SEDAR 19, established rebuilding plan (including ACLs, rec ACT, OY, and allocations – 44% comm and 56% rec) for red grouper; modified AMs; eliminated commercial and recreational aggregate ACLs (gag, black and red) and corresponding AMs. Changed MSST to equal 75% of SSB_{MSY}.	Amendment 24 (SAFMC 2011b)	7/11/12
Modified the existing gag commercial ACL and AM for gag that requires a closure of all other shallow water groupers (incl. red grouper) in the South Atlantic when the gag commercial ACL is met or projected to be met.	Regulatory Amendment 15 (SAFMC 2013)	9/12/13
Modified AMs for snapper grouper species, including red grouper	Amendment 34 (SAFMC 2015)	2/22/16

Chapter 2. Proposed Actions and Alternatives

2.1 Action 1: Revise the Rebuilding Schedule for Red Grouper

Alternative 1 (No Action). The current rebuilding schedule is set at the maximum time period allowed to rebuild (T_{max}). This is equal to 10 years with the rebuilding time period ending in 2020. 2011 was Year 1.

Alternative 2. Revise the rebuilding schedule to equal the shortest possible time period to rebuild in the absence of fishing mortality (T_{Min}). This would equal 6 years with the rebuilding time period ending in 2023. 2018 would be Year 1.

Alternative 3. Revise the rebuilding schedule to equal 8 years with the rebuilding time period ending in 2025. 2018 would be Year 1.

Alternative 4. Revise the rebuilding schedule to equal the maximum time period allowed to rebuild (T_{Max}). This would equal 10 years with the rebuilding time period ending in 2027. 2018 would be Year 1.

2.1.1 Comparison of Alternatives

2.2 Action 2: Modify the seasonal prohibition on recreational harvest and possession of red grouper in the Exclusive Economic Zone off South Carolina and North Carolina

Alternative 1 (No Action). During January through April, no person may fish for, harvest, or possess in or from the South Atlantic exclusive economic zone any shallow-water grouper (gag, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, graysby, or coney).

Preferred Alternative 2. During January through April, no person may fish for, harvest, or possess in or from the South Atlantic exclusive economic zone any shallow-water grouper (gag, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, graysby, or coney). ~~Off North Carolina and South Carolina, revise the timing of these restrictions only for red grouper as follows:~~Revise the timing of these restrictions only for red grouper in the exclusive economic zone off North Carolina and South Carolina as follows:

Preferred Sub-alternative 2a. January – May (five months)
Sub-alternative 2b. February – May (four months)
Sub-alternative 2c. March – June (four months)

2.1.2 Comparison of Alternatives

2.3 Action 3: Modify the seasonal prohibition ~~on commercial harvest and possession and sale and purchase~~ on commercial harvest, possession, sale, and purchase of red grouper in the Exclusive Economic Zone off South Carolina and North Carolina

Alternative 1 (No Action). During January through April, no person may fish for, harvest, or possess in or from the South Atlantic exclusive economic zone any shallow-water grouper (gag, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, graysby, or coney). Additionally, during January through April, no person may sell or purchase any shallow-water grouper harvested from or possessed in the South Atlantic exclusive economic zone.

Preferred Alternative 2. During January through April, no person may fish for, harvest, or possess in or from the South Atlantic exclusive economic zone any shallow-water grouper (gag, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, graysby, or coney). Additionally, during January through April, no person may sell or purchase any shallow-water grouper harvested from or possessed in the South Atlantic exclusive economic zone. ~~Off North Carolina and South Carolina, revise the timing of these restrictions only for red grouper as follows:~~Revise the timing of these restrictions only for red grouper in the exclusive economic zone off North Carolina and South Carolina as follows:

Preferred Sub-alternative 2a. January – May (five months).
Sub-alternative 2b. February – May (four months).
Sub-alternative 2c. March – June (four months).

2.1.3 Comparison of Alternatives

2.4 Action 4: Establish a commercial trip limit for red grouper harvested in the South Atlantic Exclusive Economic Zone.

Alternative 1 (No Action). There is no commercial trip limit for red grouper harvested in the South Atlantic exclusive economic zone.

Alternative 2. Establish a commercial trip limit for red grouper harvested in the South Atlantic exclusive economic zone:

Sub-alternative 2a. 75 pounds gutted weight
Sub-alternative 2b. 100 pounds gutted weight
Sub-alternative 2c. 150 pounds gutted weight
Sub-alternative 2d. 200 pounds gutted weight

2.1.4 Comparison of Alternatives

Chapter 3. Affected Environment

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

Affected Environment

- **Habitat environment (Section 3.1)**

  Examples include coral reefs and sea grass beds

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

  Examples include populations of red grouper, corals, and turtles

- **Economic environment (Section 3.3)**

  Examples include fishing communities and economic descriptions of the fisheries

- **Social environment (Section 3.4)**

  Examples include fishing communities and social description of the fisheries

- **Administrative environment (Section 3.5)**

  Examples include the fishery management process and enforcement activities

3.1 Habitat Environment

3.1.1 Inshore/Estuarine Habitat

Red grouper is one of fifty-five species managed by the South Atlantic Fishery Management Council (Council) under the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP) (SAFMC 1983). Many snapper grouper species utilize both pelagic and benthic habitats during several stages of their life histories; larval stages of these species live in the water column and feed on plankton. Most juveniles and adults are demersal (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 daytime feeding migrations or seasonal shifts in cross-shelf distributions. Additional information on the habitat utilized by species in the Snapper Grouper

Complex is included in Volume II of the Fishery Ecosystem Plan[1] (FEP; SAFMC 2018) and incorporated here by reference.

3.1.2 Offshore Habitat

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

The exact extent and distribution of productive snapper grouper habitat in South Atlantic continental shelf habitats is unknown. Current data suggest from 3% to 30% of the shelf is suitable habitat for these species. These live bottom habitats may include low relief areas, supporting sparse to moderate growth of sessile (permanently attached) invertebrates, moderate relief reefs from 0.5 to 2 meters (1.6 to 6.6 ft), or high relief ridges at or near the shelf break consisting of outcrops of rock that are heavily encrusted with sessile invertebrates such as sponges and sea fan species. Live bottom habitat is scattered irregularly over most of the shelf north of Cape Canaveral but is most abundant offshore from northeastern Florida. South of Cape Canaveral the continental shelf narrows from 56 to 16 kilometers (35 to 10 mi) wide off the southeast coast of Florida and the Florida Keys. The lack of a large shelf area, presence of extensive, rugged living fossil coral reefs, and dominance of a tropical Caribbean fauna are distinctive benthic characteristics of this area.

Rock outcroppings occur throughout the continental shelf from Cape Hatteras, North Carolina to Key West, Florida (MacIntyre and Milliman 1970; Miller and Richards 1979; Parker et al. 1983), which are principally composed of limestone and carbonate sandstone (Newton et al. 1971), and exhibit vertical relief ranging from less than 0.5 to over 10 meters (33 ft). Ledge systems formed by rock outcrops and piles of irregularly sized boulders are also common. Parker et al. (1983) estimated that 24% (9,443 km^2) of the area between the 27 and 101-meter (89 and 331 ft) depth contours from Cape Hatteras, North Carolina, to Cape Canaveral, Florida, is reef habitat. Although the bottom communities found in water depths between 100 and 300 meters (328 and 984 ft) from Cape Hatteras, North Carolina, to Key West, Florida, is relatively small compared to the whole shelf, this area, based upon landing information of fishers, constitutes prime reef fish habitat and probably significantly contributes to the total amount of reef habitat in this region.

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 un-vegetated areas of little or no relief. There are several notable shipwrecks along the southeast coast in state and federal waters including *Lofthus* (eastern Florida), *SS Copenhagen* (southeast Florida), *Half Moon* (southeast Florida), *Hebe* (Myrtle Beach, South Carolina), *Georgiana* (Charleston, South Carolina), *U.S.S. Monitor* (Cape Hatteras, North Carolina), *Huron* (Nags Head, North Carolina), and *Metropolis* (Corolla, North Carolina).

[1] http://safmc.net/ecosystem-management/fishery-ecosystem-plan/

The distribution of coral and live hard bottom habitat as presented in the Southeast Marine Assessment and Prediction Program bottom mapping project is a proxy for the distribution of the species within the snapper grouper complex. Maps are available on the Council's Habitat and Ecosystem Atlas[2].

Plots of the spatial distribution of offshore species were generated from the Marine Resources Monitoring, Assessment, and Prediction Program (MARMAP) data. The plots serve as point confirmation of the presence of each species within the scope of the sampling program. These plots, in combination with the hard bottom habitat distributions previously mentioned, can be employed as proxies for offshore snapper grouper complex distributions in the South Atlantic region. Maps of the distribution of snapper grouper species by gear type based on MARMAP data can also be generated through the Council's Habitat and Ecosystem Atlas.

Additional information on the habitat utilized by snapper grouper species is included in Volume II of the Fishery Ecosystem Plan (FEP; SAFMC 2018).

3.1.3 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. Specifically, estuarine/inshore EFH includes: Estuarine emergent and mangrove wetlands, submerged aquatic vegetation, oyster reefs and shell banks, intertidal flats, palustrine emergent and forested systems, aquatic beds, and estuarine water column. Additionally, marine/offshore EFH includes: live/hard bottom habitats, coral and coral reefs, artificial and manmade reefs, *Sargassum* species, and marine water column.

EFH utilized by snapper grouper species in this 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 ft (but to at least 2,000 ft 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 meter (100-ft) contour, such as attached macroalgae; 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.

[2] http://ocean.floridamarine.org/safmc_atlas/

3.1.4 Habitat Areas of Particular Concern

Areas which meet the criteria for Essential Fish Habitat-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; South Atlantic Council-designated Artificial Reef Special Management Zones (SMZs); and deepwater Marine Protected Areas (MPAs). Areas that meet the criteria for EFH-HAPCs include habitats required during each life stage (including egg, larval, postlarval, juvenile, and adult stages).

In addition to protecting habitat from fishing related degradation though fishery management plan regulations, the South Atlantic Council, in cooperation with NMFS, actively comments on non-fishing projects or policies that may impact essential fish habitat. With guidance from the Habitat Advisory Panel, the South Atlantic Council has developed and approved policies on: energy exploration, development, transportation and hydropower re-licensing; beach dredging and filling and large-scale coastal engineering; protection and enhancement of submerged aquatic vegetation; alterations to riverine, estuarine and near shore flows; offshore aquaculture; and marine and estuarine invasive species.

The potential impacts the actions in this regulatory amendment may have on EFH, and EFH-HAPCs are discussed in **Chapter 4** of this document.

3.2 Biological and Ecological Environment

3.2.1 Fish Populations Affected by this Regulatory Amendment

The reef environment in the South Atlantic management area affected by actions in this environmental impact statement is defined by two components (**Figure 3.2.1**). Each component will be described in detail in the following sections.

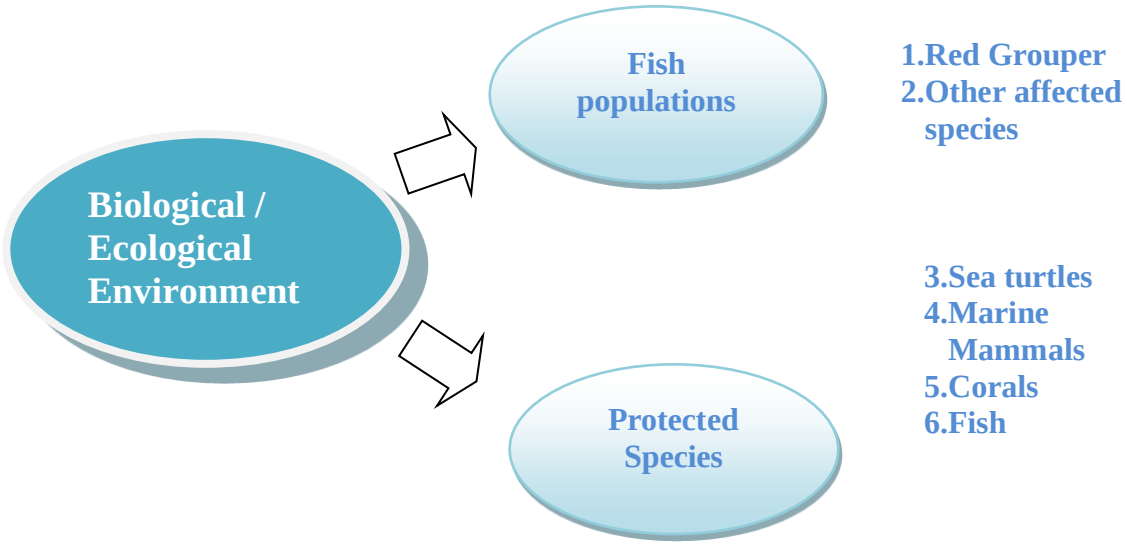

Figure 3.2.1. Two components of the biological environment described in this document.

The waters off the South Atlantic coast are home to a diverse population of fish. The snapper grouper fishery management unit contains 55 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.

Several species in the snapper grouper fishery management unit, though they occupy the same time and space in the reef environment, occupy different trophic niches. For example, blueline tilefish consume a higher diversity of organisms and prey that is more closely associated with the bottom (Bielsa et al. 1987). In contrast, the diet of snowy grouper is more specialized and prey items are found higher in the water column. It has been suggested that the different trophic niches reduce the interspecific competition for food items among these two species (Bielsa et al 1987).

Additional life history information for co-occurring species affected by this regulatory amendment may be found in the South Atlantic EcoSpecies Database[3]. Other species most likely to co-occur with red grouper include gag, gray triggerfish, greater amberjack, red snapper, scamp, speckled hind, and vermilion snapper. Amendment 17A to the FMP (SAFMC 2010) describes the life history characteristics of these species in detail. The timing of spawning for several snapper grouper species in the South Atlantic region is summarized in **Table 3.2.1**.

Table 3.2.1. Timing of spawning (gray shading) and peak spawning (black shading) for exploited Atlantic Ocean reef fish stocks off the southeastern United States.
Months in bold denote core SERFS core fishery-independent sampling months.

Stock	Jan	Feb	Mar	Apr	**May**	**Jun**	**Jul**	**Aug**	**Sep**	Oct	Nov	Dec	Citation
Gray triggerfish													[10]
Greater amberjack													[7]
White grunt													[14, 17]
Cubera Snapper													WDH, pers. comm.
Red snapper													[17, 18]
Vermilion snapper													[2, 17]
Blueline tilefish													[6]
Tilefish													[4, 17]
Black sea bass													[15, 17]
Gag													[13, 17]
Red grouper													[1]
Scamp (NC)													[12]
Scamp (FL)													[5]
Scamp (29.95–32.95 °N)													[8, 17]
Snowy grouper													[16, 19]
Speckled hind													[20]
Warsaw Grouper													[11, 17]
Red porgy													[3, 17]

doi:10.1371/journal.pone.0172968.t006
Source: Farmer et al. 2017 and references therein.

3.2.2 Red Grouper (*Epinephelus morio*)

Life History

Life history, biological characteristics, and stock status information for red grouper may be found the Southeast Data, Assessment, and Review (SEDAR) report, SEDAR 53 (2017), which is available on the SEDAR web site http://www.sefsc.noaa.gov/sedar/ and is hereby incorporated by reference (see **Section 3.2.3** for more information on the SEDAR process).

Red grouper, *Epinephelus morio*, is primarily a continental species, mostly found in broad shelf areas (Jory and Iversen 1989). Red grouper is distributed in the Western Atlantic, from North Carolina to southeastern Brazil, including the eastern Gulf of Mexico and Bermuda, but can occasionally be found as far north as Massachusetts (Heemstra and Randall 1993). The red grouper is uncommon around coral reefs; it generally occurs over flat rock perforated with solution holes (Bullock and Smith 1991, and is

[3] http://saecospecies.azurewebsites.net

commonly found in the caverns and crevices of limestone reef in the Gulf of Mexico (Moe 1969). It also occurs over rocky reef bottoms (Moe 1969).

Adult red grouper are sedentary fish that are usually found at depths of 5-300 meters (16-984 feet). Fishermen off North Carolina commonly catch red grouper at depths of 27-76 meters (88-249 feet) with an average of 34 meters (111 feet). Fishermen off southeastern Florida also catch red grouper in depths ranging from 27-76 with an average depth of 45 meters (148 feet) (Burgos 2001; McGovern et al., 2002). Moe (1969) reported that juveniles live in shallow water nearshore reefs until they are 40 centimeters (16 inches) and 5 years of age, when they become sexually mature and move offshore. Spawning occurs during February-June, with a peak in April (**Table 3.2.1** and Burgos 2001). In the eastern Gulf of Mexico, ripe females are found December through June, with a peak during April and May (Moe 1969). The months of March-April were closed to gag and black grouper harvest in 1999 (SAFMC 1999). The current January-April spawning season closure for all shallow-water groupers was implemented in 2009 through Amendment 16 to the Snapper Grouper FMP (SAFMC 2009a) in order to protect shallow-water grouper species from fishing mortality during a vulnerable time of their life history. Fishermen have indicated, however, that red grouper harvested in May off North Carolina are frequently in spawning condition and there is concern that the current spawning season closure is not capturing the bulk of spawning activity for that species off North Carolina (SAFMC, port meetings 2014). Detailed information on the spatial distribution of red grouper spawning activity is needed to corroborate this information. Based on the presence of ripe adults (Moe 1996) and larval red grouper (Johnson and Keener 1984), spawning probably occurs offshore. Coleman et al. (1996) found groups of spawning red grouper at depths of 21-110 meters (70-360 feet). Red grouper do not appear to form spawning aggregations or spawn at specific sites (Coleman et al. 1996). They are reported to spawn in depths of 30-90 meters (98-295 feet) off the Southeast Atlantic coast (Burgos 2001; McGovern et al. 2002).

Red grouper are protogynous hermaphrodites, meaning they function as a female first and later transition to males. The proportion of males in the population increases with age. Off North Carolina, red grouper first become males at 50.9 centimeters (20.1 inches) TL and males dominate size classes greater than 70 centimeters (27.8 inches) TL. Most females transform to males between ages 7 and 14. Burgos (2001) reported that 50% of the females caught off North Carolina are undergoing sexual transition at age 8. Maximum age reported by Heemstra and Randall (1993) was 25 years. Burgos (2001) and McGovern et al. (2002) indicated that red grouper live for at least 20 years in the Southeast Atlantic and a maximum age of 26 years has been reported for red grouper in the Gulf of Mexico (L. Lombardi, NMFS Panama City, personal communication). Natural mortality rate is estimated to be 0.14 (SEDAR 19 2010). Maximum reported size is 125.0 centimeters (49.2 inches) TL (male) and 23.0 kilograms (51.1 lb). For fish collected off North Carolina during the late 1990s, age at 50% maturity of females is 2.4 years and size at 50% maturity is 48.7 centimeters (19.3 inches) TL. Off southeastern Florida, age at 50% maturity was 2.1 years and size at 50% maturity was 52.9 centimeters (21.0 inches) TL (Burgos 2001; McGovern et al. 2002). These fish eat a wide variety of fishes, octopuses, and crustaceans, including shrimp, lobsters, and stomatopods (Bullock and Smith 1991; Heemstra and Randall 1993).

Biomass and Landings

At their October 2017 meeting, the SSC recommended ABCs based on $F_{REBUILD}$ with the low recruitment scenario projections (SSC 2017). Through Framework Amendment 1, setting ACLs (equal to

ABCs) for red grouper at the SSC's recommended levels is expected to provide biological benefits to the red grouper stock. The lower ACLs could constrain future harvest and prevent overfishing if the stock experiences a year of high recruitment and additional red grouper are available for harvest. However, based on recent commercial and recreational landings, the projected ACLs would result in minimal actual reduction in harvest despite the large reduction in total ACL (from 780,000 to 139,000 lbs ww for 2018).

Since 2012, recreational landings have hovered below 200,000 lbs ww, ranging between 9 and 36% of the recreational ACL (**Table 3.2.2**). In 2015, the commercial sector only landed 30% of their ACL, and in 2016 the sector landed 15% of its ACL. In 2012, commercial landings were at 55% of the ACL, and by 2017, landings were only 12% of commercial ACL, which shows a continuing declining trend in landings, especially in that sector (**Figure 3.2.2**). The reduced level of observed landings is supported by subjective information received from commercial and recreational stakeholders who often state that red grouper are not being seen in large quantities in the South Atlantic. A productivity regime shift and certain environmental factors could be driving the low observed numbers of fish, and the recent (since 2005) poor recruitment may or may not continue into the future (SEDAR 53 2017).

Table 3.2.2. South Atlantic red grouper landings and ACLs in lbs ww, 2012-2017.

	Total ACL	Total Landings	% ACL	Commercial			Recreational		
				Landings	ACL	% ACL	Landings	ACL	% ACL
2017	780,000	136,920	18	40,490	343,200	12	96,430	436,800	22
2016	780,000	207,561	27	52,290	343,200	15	155,271	436,800	36
2015	780,000	231,573	30	103,360	343,200	30	128,213	436,800	29
2014	780,000	173,363	22	134,607	343,200	39	38,756	436,800	9
2013	718,000	207,247	29	120,124	315,920	38	87,123	402,080	22
2012	647,000	259,135	40	157,531	284,680	55	101,604	362,320	28

Source: NMFS SERO ACL.

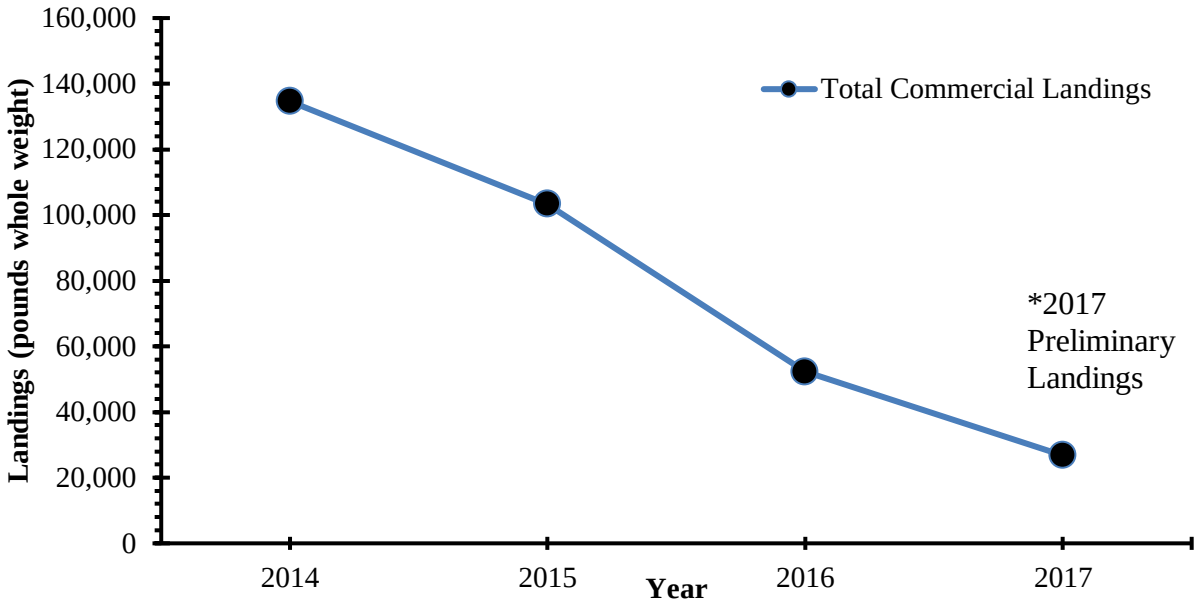

Figure 3.2.2. South Atlantic red grouper commercial landings (lbs ww) by year for 2014-2017. The 2017 landings are preliminary and are only available from January 1 to October 24, 2017.
Source:

Discards and Bycatch

Release (discard) mortality rates are unknown for many managed species; however, some SEDAR assessments include estimates of release mortality rates based on published studies.

Discards of red grouper are relatively low overall in the South Atlantic (**Table 3.2.2**). Red grouper is part of a multi-species fishery. Additional information on red grouper biology can be found in Amendment 24 to the FMP (SAFMC 2011). With a large reduction in the ACL through the implementation of Abbreviated Framework 1 (SAFMC 2017), commercial harvest of red grouper is expected to become primarily incidental while fishermen target other snapper grouper species. The potential for high-grading is expected to be minimal in this sector. Targeting of red grouper by the recreational sector would likely be relatively limited, and the proposed action is not anticipated to substantially increase bycatch of co-occurring species.

While unlikely, a reduction in the red grouper ACLs could increase regulatory discards if fishermen continue to encounter the species once the ACL is reached, and possession and retention is subsequently prohibited. The estimated release mortality for red grouper is 20% (SEDAR 53, 2017). However, fishermen may fish in specific areas to avoid red grouper once, and if, the ACL is reached. Current regulations, including the requirements of dehooking devices, circle hooks, and a recreational/commercial seasonal closure for shallow water groupers could also help to reduce bycatch of red grouper. See **Appendix H (Data Analysis)** for more information on discards and bycatch.

Table 3.2.3. The total number of South Atlantic red grouper discards recorded from X-X for different sectors of the commercial and recreational fisheries. Commercial discards are from self-reported logbook information and unexpanded. Discards were aggregated across years due to confidentiality concerns.

Fishery and Sector	Number
Commercial - Longline	
Commercial - Hook-and-line	
Recreational - Private	
Recreational - Charter	
Recreational - Headboat	

Source: X

3.2.3 Stock Status of Red Grouper

Stock assessments provide an evaluation of stock health under the current management regime and other potential future harvest conditions. More specifically, the assessments provide an estimation of maximum sustainable yield (MSY) and a determination of stock status (whether *overfishing* is occurring and whether the stock is *overfished*).

The SEDAR process, initiated in 2002, is a cooperative Fishery Management Council process intended to improve the quality, timeliness and reliability of fishery stock assessments in the South Atlantic, Gulf of Mexico, and US Caribbean. SEDAR is managed by the fishery management councils in the Caribbean, Gulf of Mexico, and South Atlantic regions, in coordination with NMFS and the Atlantic and Gulf States Marine Fisheries Commissions. SEDAR emphasizes constituent and stakeholder participation in assessment development, transparency in the assessment process, and a rigorous and independent scientific review of completed stock assessments.

Following an assessment, the South Atlantic Council's Scientific and Statistical Committee (SSC) reviews the stock assessment information and advises the Council on whether the stock assessment was performed utilizing the best available data and whether the outcome of the assessment is suitable for management purposes.

Red Grouper Assessment, Stock Status and Management Response

On June 23, 2017, the South Atlantic Council requested the Southeast Fishery Science Center (SEFSC) produce rebuilding projections for red grouper based on SEDAR 53. The Council's SSC reviewed four rebuilding projections produced by the SEFSC at their October 2017 meeting. The projections were based on fishing mortality rates of F_{MSY} and $F_{REBUILD}$, each with long-term (expected) recruitment and low recruitment scenarios. Due to poor recruitment trends for the red grouper stock in recent years, the SSC recommended the projections at F_{MSY} and the low recruitment scenario for the overfishing limit (OFL), and projections for $F_{Rebuild}$ under the low recruitment scenario for the ABC. The South Atlantic Council followed the recommendations of their SSC in Abbreviated Framework 1 (SAFMC 2017) by implementing new ACLs based on the ABC from the $F_{REBUILD}$ low recruitment scenario to end overfishing. The total projected ACL is 139,000 pounds whole weight (lbs ww) for 2018, 150,000 lbs ww for 2019, and 162,000 lbs ww for 2020 (**Table 3.2.4**). Sector allocations are 56% recreational and 44% commercial.

Table 3.2.4. Red grouper OFLs, ABCs, and ACLs beginning in 2018 in lbs ww based on recommendations from the Council's SSC implemented through Abbreviated Framework 1. Sector allocations are 56% recreational and 44% commercial. Amendment 24 set the total ACL equal to the ABC (SAFMC 2011).

	OFL	ABC	Total ACL	Commercial ACL	Recreational ACL
2018	183,000	139,000	139,000	61,160	77,840
2019	191,000	150,000	150,000	66,000	84,000
2020 until modified	202,000	162,000	162,000	71,280	90,720

3.2.4 Other Fish Species Affected

See **Appendix I (Bycatch Practicability Analysis)** for more information on bycatch and co-occurring species. For life history information of the remainder of species in the Fishery Management Unit that are not directly affected by actions in this regulatory amendment, refer to the South Atlantic Ecospecies Database (see reference above).

3.2.5 Protected Species

NMFS manages marine protected species in the Southeast region under the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA). There are 29 ESA-listed species or Distinct Population Segments (DPSs) of marine mammals, sea turtles, fish, and corals managed by NMFS that may occur in the EEZ of the South Atlantic or Gulf of Mexico. There are 91 stocks of marine mammals managed within the Southeast region plus the addition of the stocks such as north atlantic right whales (NARWs), and humpback, sei, fin, minke, and blue whales that regularly or sometimes occur in Southeast region managed waters for a portion of the year (Hayes et al. 2017). All marine mammals in U.S. waters are protected under the MMPA. The MMPA requires that each commercial fishery be classified by the number of marine mammals they seriously injure or kill. NMFS's List of Fisheries (LOF) classifies U.S. commercial fisheries into three categories based on the number of incidental mortality or serious injury they cause to marine mammals. More information about the LOF and the classification process can be found at: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-protection-act-list-fisheries.

Five of the marine mammal species (NARW, and sperm, sei, fin, and blue whales) protected by the MMPA, are also listed as endangered under the ESA. In addition to those five marine mammals, six species or DPSs of sea turtles (green (the North Atlantic DPS and the South Atlantic DPS), hawksbill, Kemp's ridley, leatherback, and the Northwest Atlantic DPS of loggerhead); nine species or DPSs of fish (the smalltooth sawfish; five DPSs of Atlantic sturgeon, Nassau grouper; oceanic whitetip shark, and giant manta ray); and seven species of coral (elkhorn coral, staghorn coral, rough cactus coral, pillar coral, lobed star coral, mountainous star coral, and boulder coral) are also protected under the ESA and occur within the action area of the snapper grouper fishery. Portions of designated critical habitat for NARW, the Northwest Atlantic DPS of loggerhead sea turtles, and *Acropora* corals occur within the South Atlantic Council's jurisdiction.

NMFS has conducted specific analyses ("Section 7 consultations") to evaluate the potential adverse effects from the South Atlantic snapper grouper fishery on species and critical habitat protected under the ESA. On December 1, 2016, NMFS completed its most recent biological opinion (2016 Opinion) on the snapper grouper fishery of the South Atlantic Region (NMFS 2016). In the 2016 Opinion, NMFS concluded that this fishery's continued authorization is likely to adversely affect but is not likely to jeopardize the continued existence of the NARW, loggerhead sea turtle Northwest Atlantic DPS, leatherback sea turtle, Kemp's ridley sea turtle, green sea turtle North Atlantic DPS, green sea turtle South Atlantic DPS, hawksbill sea turtle, smalltooth sawfish U.S. DPS, or Nassau grouper. NMFS also concluded that designated critical habitat and other ESA-listed species in the South Atlantic Region were not likely to be adversely affected. Summary information on the species that may be adversely affected by the snapper grouper fishery and how they are affected is presented below. The 2016 Opinion provides additional information on these species, how they are affected by the snapper grouper fishery, and the authorized incidental take levels of these species in the snapper grouper fishery.

Since publication of the 2016 Opinion, NMFS has published two additional final listing rules. On January 22, 2018, NMFS listed the giant manta ray (Manta birostris) as threatened under the ESA, effective February 21, 2018. On January 30, 2018, NMFS listed the oceanic whitetip shark (Carcharinus longimanus) as threatened under the ESA, effective March 1, 2018. Giant manta rays and oceanic whitetip sharks are found in the South Atlantic and may be affected by the subject fishery via incidental capture in snapper grouper fishing gear. In a June 11, 2018, memo NMFS documented ESA Section 7(a)(2) and Section 7(d) determinations for allowing the continued authorization of fishing managed by the Snapper Grouper FMP, during reinitiation of ESA consultation on this fishery, for its effects on the giant manta ray and the oceanic whitetip shark. Based on the analysis, NMFS determined that allowing the proposed action to continue during the reinitiation period will not violate Section 7(a)(2) or 7(d). This Section 7(a)(2) determination is only applicable to the proposed action during the reinitiation period and does not address the agency's long-term obligation to ensure its actions are not likely to jeopardize the continued existence of any listed species or destroy or adversely modify critical habitat.

3.2.5.1 North Atlantic Right Whales (NARW)

The NARW, *Eubalaena glacialis* (Rosenbaum et al. 2000), is a large baleen whale. NARWs feed on larger species of zooplankton and almost exclusively on copepods. Feeding takes place subsurface (subsurface feeding) or at the water's surface (surface skim feeding), depending on the vertical distribution of their food species. NARW dive as deep as 306 m (1,003 ft) (Mate et al. 1992).

The coastal waters of the southeastern U.S. are a wintering and the sole known calving area for NARW. NARW generally occur off South and North Carolina from November 1 through April 30 and have been sighted as far as about 30 nautical miles (nmi) offshore (Knowlton et al. 2002; Pabst et al. 2009). Sighting records of NARW spotted in the core calving area off Georgia and Florida consist of mostly mother-calf pairs and juveniles but also some adult males and females without calves (Cole et al. 2013; Kraus and Rolland 2007; Parks et al. 2007). The NARW minimum stock size is based on a census of individual whales identified using photo-identification techniques. A review of the photo-ID recapture database as it existed on 17 November 2015 indicated that 440 individually recognized whales in the catalog were known to be alive during 2012. This number represents a minimum population size. This is

a direct count and has no associated coefficient of variation (Hayes et al. 2017). Since June 7, 2017, elevated NARW mortalities began in 2017, primarily in Canada and were declared an Unusual Mortality Event (UME). In 2017 a total of 17 confirmed dead stranded whales (12 in Canada; 5 in the U.S.), and five live whale entanglements in Canada have been documented. To date in 2018, one whale stranded in the U.S. bringing the total mortalities to 18 confirmed dead stranded whales (12 in Canada; 6 in the U.S.). More information on this UME is provided at: https://www.fisheries.noaa.gov/national/marine-life-distress/2017-2018-north-atlantic-right-whale-unusual-mortality-event

Right whale concentrations are highest in the core calving area from November 15 through April 15 (71 FR 36299, June 26, 2006); on rare occasions, right whales have been spotted as early as September and as late as July (Taylor et al. 2010). Most calves are likely born early in the calving season. NARW distribution off Georgia and Florida is restricted to the south and east by the warm waters of the Gulf Stream, which serves as a thermal limit for NARW (Keller et al. 2006). Water temperature, bathymetry, and surface chop are factors in the distribution of calving NARW in the southeastern U.S. (Good 2008; Keller et al. 2012). Systematic surveys conducted off the coast of North Carolina during the winters of 2001 and 2002 sighted eight calves, suggest the calving grounds may extend as far north as Cape Fear. Four of the calves were not sighted by surveys conducted further south. One of the cows photographed was new to researchers, having effectively eluded identification over the period of its maturation (McLellan et al. 2003).

Commercial and recreational fishers in the South Atlantic snapper grouper fishery use hook-and-line gear, spear/powerheads, and pot/traps to target black sea bass, but only pots may adversely affect NARWs (NMFS 2016). The black seas bass pot component of the snapper grouper fishery is the only component of the fishery that may adversely affect NARWs; effects from all the other gear types were discounted in the 2016 Opinion. NMFS estimated that the number of annual lethal takes for NARWs from black sea bass trap/pot gear ranged from an estimated minimum of 0.005 to a maximum of 0.08. This equates to 1 estimated lethal entanglement approximately every 25 to 42 years.

3.2.5.2 ESA-Listed Sea Turtles

Green, hawksbill, Kemp's ridley, leatherback, and loggerhead sea turtles are all highly migratory and travel widely throughout the South Atlantic. The following sections are a brief overview of the general life history characteristics of the sea turtles found in the South Atlantic region. Several volumes exist that cover the biology and ecology of these species more thoroughly (i.e., Lutz and Musick (eds.) 1997, Lutz et al. (eds.) 2002).

Green sea turtle (*Chelonia mydas*) hatchlings are thought to occupy pelagic areas of the open ocean and are often associated with *Sargassum* rafts (Carr 1987, Walker 1994). Pelagic stage green sea turtles are thought to be carnivorous. Stomach samples of these animals found ctenophores and pelagic snails (Frick 1976, Hughes 1974). At approximately 20 to 25 cm carapace length, juveniles migrate from pelagic habitats to benthic foraging areas (Bjorndal 1997). As juveniles move into benthic foraging areas a diet shift towards herbivory occurs. They consume primarily seagrasses and algae, but are also know to consume jellyfish, salps, and sponges (Bjorndal 1980, 1997; Paredes 1969; Mortimer 1981, 1982). The diving abilities of all sea turtles species vary by their life stages. The maximum diving range of green sea turtles is estimated at 110 m (360 ft) (Frick 1976), but they are most frequently making dives of less than

20 m (65 ft.) (Walker 1994). The time of these dives also varies by life stage. The maximum dive length is estimated at 66 minutes with most dives lasting from 9 to 23 minutes (Walker 1994). On April 6, 2016, NMFS and the U.S. Fish and Wildlife Service published a Final Rule in the Federal Register (81 FR 20057) removing the range-wide and breeding population ESA listings of the green sea turtle, and in their place, listing 8 green sea turtle DPSs as threatened and 3 green sea turtle DPSs as endangered, effective May 6, 2016. Two of the green sea turtle DPSs, the North Atlantic DPS and the South Atlantic DPS, occur in the South Atlantic Region.

The **hawksbill sea turtle's** (*Eretmochelys imbricata*) pelagic stage lasts from the time they leave the nesting beach as hatchlings until they are approximately 22-25 cm in straight carapace length (Meylan 1988, Meylan and Donnelly 1999). The pelagic stage is followed by residency in developmental habitats (foraging areas where juveniles reside and grow) in coastal waters. Little is known about the diet of pelagic stage hawksbills. Adult foraging typically occurs over coral reefs, although other hard-bottom communities and mangrove-fringed areas are occupied occasionally. Hawksbills show fidelity to their foraging areas over several years (Van Dam and Diéz 1998). The hawksbill's diet is highly specialized and consists primarily of sponges (Meylan 1988). Gravid females have been noted ingesting coralline substrate (Meylan 1984) and calcareous algae (Anderes Alvarez and Uchida 1994), which are believed to be possible sources of calcium to aid in eggshell production. The maximum diving depths of these animals are not known, but the maximum length of dives is estimated at 73.5 minutes. More routinely, dives last about 56 minutes (Hughes 1974).

Kemp's ridley sea turtle (*Lepidochelys kempii*) hatchlings are also pelagic during the early stages of life and feed in surface waters (Carr 1987, Ogren 1989). Once the juveniles reach approximately 20 cm carapace length they move to relatively shallow (less than 50 m) benthic foraging habitat over unconsolidated substrates (Márquez-M. 1994). They have also been observed transiting long distances between foraging habitats (Ogren 1989). Kemp's ridleys feeding in these nearshore areas primarily prey on crabs, though they are also known to ingest mollusks, fish, marine vegetation, and shrimp (Shaver 1991). The fish and shrimp Kemp's ridleys ingest are not thought to be a primary prey item but instead may be scavenged opportunistically from bycatch discards or from discarded bait (Shaver 1991). Given their predilection for shallower water, Kemp's ridleys most routinely make dives of 50 m or less (Soma 1985, Byles 1988). Their maximum diving range is unknown. Depending on the life stage, Kemp's ridleys may be able to stay submerged anywhere from 167 minutes to 300 minutes, though dives of 12.7 minutes to 16.7 minutes are much more common (Soma 1985, Mendonca and Pritchard 1986, Byles 1988). Kemp's ridleys may also spend as much as 96% of their time underwater (Soma 1985, Byles 1988).

Leatherback sea turtles (*Dermochelys coriacea***)** are the most pelagic of all ESA-listed sea turtles and spend most of their time in the open ocean. Although they will enter coastal waters and are seen over the continental shelf on a seasonal basis to feed in areas where jellyfish are concentrated. Leatherbacks feed primarily on cnidarians (medusae, siphonophores) and tunicates. Unlike other sea turtles, leatherbacks' diets do not shift during their life cycles. Because leatherbacks' ability to capture and eat jellyfish is not constrained by size or age, they continue to feed on these species regardless of life stage (Bjorndal 1997). Leatherbacks are the deepest diving of all sea turtles. It is estimated that these species can dive in excess of 1,000 m (Eckert et al. 1989) but more frequently dive to depths of 50 m to 84 m (Eckert et al. 1986). Dive times range from a maximum of 37 minutes to more routines dives of 4 to 14.5

minutes (Standora et al. 1984, Eckert et al. 1986, Eckert et al. 1989, Keinath and Musick 1993). Leatherbacks may spend 74% to 91% of their time submerged (Standora et al. 1984).

Loggerhead sea turtle (*Caretta caretta*) hatchlings forage in the open ocean and are often associated with *Sargassum* rafts (Hughes 1974, Carr 1987, Walker 1994, Bolten and Balazs 1995). The pelagic stage of these sea turtles eat a wide range of organisms including salps, jellyfish, amphipods, crabs, syngnathid fish, squid, and pelagic snails (Brongersma 1972). Stranding records indicate that when pelagic immature loggerheads reach 40-60 cm straight-line carapace length they begin to live in coastal inshore and nearshore waters of the continental shelf throughout the U.S. Atlantic (Witzell 2002). Here they forage over hard- and soft-bottom habitats (Carr 1986). Benthic foraging loggerheads eat a variety of invertebrates with crabs and mollusks being an important prey source (Burke et al. 1993). Estimates of the maximum diving depths of loggerheads range from 211 m to 233 m (692-764ft.) (Thayer et al. 1984, Limpus and Nichols 1988). The lengths of loggerhead dives are frequently between 17 and 30 minutes (Thayer et al. 1984, Limpus and Nichols 1988, Limpus and Nichols 1994, Lanyan et al. 1989) and they may spend anywhere from 80 to 94% of their time submerged (Limpus and Nichols 1994, Lanyan et al. 1989).

On September 22, 2011, NMFS and the U.S. Fish and Wildlife Service determined the loggerhead sea turtle population consists of nine DPSs (76 FR 58868). Previously, loggerhead sea turtles were listed as threatened species throughout their global range. The snapper grouper fishery interacts with loggerhead sea turtles from what is now considered the Northwest Atlantic DPS, which remains listed as threatened. The February 15, 2012, memorandum stated that because the 2006 Opinion had evaluated the impacts of the fishery on the loggerhead subpopulations now wholly contained within the Northwest Atlantic DPS, the 2006 Opinion's conclusion that the fishery is not likely to jeopardize the continued existence of loggerhead sea turtles remains valid.

Sea turtles are vulnerable to capture by bottom longline and vertical hook-and-line gear. Hook-and-line gear used in the fishery includes commercial bottom longline gear and commercial and recreational vertical line gear (e.g., handline, bandit gear, and rod-and-reel). The magnitude of the interactions between sea turtles and the South Atlantic snapper grouper fishery was most recently evaluated in the 2016 biological opinion (i.e., NMFS (2016a). In **Table 3.2.6.1** the 3-year estimated captures and mortalities authorized for the fishery in the 2016 biological opinion are specified. Section 5.2 of the 2016 biological opinion presents a summary of the data sources considered for the sea turtle analyses, estimation methods, and data limitations and assumptions associated with the estimates for each fishery component. Loggerhead sea turtles are the species most affected by the proposed action. The majority of estimated sea turtle captures appear to occur in the recreational vertical lines targeting snapper grouper species due to the large amount of recreation fishing effort. However, it is also important to recognize that the sea turtle capture estimates for the recreational vertical line are also likely the most uncertain.

Table 3.2.6.1. Estimated 3-year sea turtle (T) and mortalities (M) estimates in the South Atlantic Snapper Grouper Fishery by fishery component and overall.

Fishery Component	Loggerhead		Kemp's ridley		Green		Hawksbill		Leatherback	
	T	M	T	M	T	M	T	M	T	M
Commercial Bottom Longline*	9	5	1	1	1	1	1	1	3	2

Commercial Vertical Line**	62	26	18	8	11	5	1	1	1	1
Recreational Vertical Line ***	546	165	159	48	96	30	2	1	1	1
All Components Combined	617	196	178	57	108	36	5	3	5	4
*Only 10 hardshell sea turtles combined are estimated to be captured every 3 years; only 1 hawksbill, Kemp's ridley or green sea turtle is expected to be captured and killed every 3 years in this component. **No more than 90 hardshell sea turtles combined are estimated for this component. ***No more than 801 hardshell sea turtle combined are estimated for this component.										

Regulations implemented through Amendment 15B to the Snapper Grouper FMP (74 FR 31225; June 30, 2009; SAFMC 2008) require all commercial or charter/headboat vessels with a South Atlantic snapper grouper permit, carrying hook-and-line gear on board, to possess required literature and release gear to aid in the safe release of incidentally caught sea turtles. Comprehensive Ecosystem-Based Amendment 2 modified these requirements (76 FR 82183; December 30, 2011; SAFMC 2011e) by requiring different gear for vessels with different freeboard heights, mirroring the requirements in the Gulf of Mexico. These regulations are thought to decrease the mortality associated with accidental interactions with sea turtles.

Snapper grouper vessels transiting to and from fishing areas and moving during fishing activity also pose a potential threat to sea turtles (NMFS 2016a). As explained in the 2016 biological opinion, it is very difficult to definitively or even approximately evaluate the potential risk to sea turtles stemming from specific vessel traffic from any action because of the numerous variables (e.g., vessel type, speed, traffic, environmental conditions, sea turtle abundance in area transited) that may impact vessel strike rates. This difficulty is compounded by a general lack of information on vessel use trends, particularly in regard to offshore vessel traffic.

3.2.5.3 ESA-Listed Marine Fish

Smalltooth sawfish (*Pristis pectinata*)

Historically the **smalltooth sawfish** in the U.S. ranged from New York to the Mexico border. Their current range is poorly understood but believed to have contracted from these historical areas. In the South Atlantic region, they are most commonly found in Florida, primarily off the Florida Keys (Simpfendorfer and Wiley 2004). Only two smalltooth sawfish have been recorded north of Florida since 1963 [the first was captured off North Carolina in 1963 and the other off Georgia in 2002 (National Smalltooth Sawfish Database, Florida Museum of Natural History)]. Historical accounts and recent encounter data suggest that immature individuals are most common in shallow coastal waters less than 25 meters (Bigelow and Schroeder 1953, Adams and Wilson 1995), while mature animals occur in waters in excess of 100 meters (Simpfendorfer pers. comm. 2006). Smalltooth sawfish feed primarily on fish. Mullet, jacks, and ladyfish are believed to be their primary food sources (Simpfendorfer 2001). Smalltooth sawfish also prey on crustaceans (mostly shrimp and crabs) by disturbing bottom sediment with their saw (Norman and Fraser 1938, Bigelow and Schroeder 1953).

On June 29, 2016, NMFS published a final rule in the *Federal Register* listing **Nassau grouper** as threatened under the ESA due to a decline in its population (81 FR 42268). The final rule became

effective on July 29, 2016. The Nassau grouper's confirmed distribution currently includes "Bermuda and Florida (USA), throughout the Bahamas and Caribbean Sea" (e.g., Heemstra and Randall 1993, Hill and Sadovy de Mitcheson, 2013). The Nassau grouper is primarily a shallow-water, insular fish species that has long been valued as a major fishery resource throughout the wider Caribbean, South Florida, Bermuda, and the Bahamas (Carter et al. 1994). As larvae, Nassau grouper are planktonic. After an average of 35-40 days and at an average size of 32 millimeters total length (TL), larvae recruit from an oceanic environment into demersal habitats (Colin 1992, Eggleston 1995). Juvenile Nassau grouper (12-15 centimeters TL) are relatively solitary and remain in specific areas (associated with macroalgae, and both natural and artificial reef structure) for months (Bardach et al.1958). As juveniles grow, they move progressively to deeper areas and offshore reefs (Tucker et al. 1993, Colin et al. 1997). Smaller juveniles occur in shallower inshore waters (3.7-16.5 meters [m]) and larger juveniles are more common near deeper (18.3-54.9 m) offshore banks (Bardach et al. 1958, Cervigón 1966, Silva Lee 1974, Radakov et al. 1975, Thompson and Munro 1978). Adult Nassau grouper also tend to be relatively sedentary and are commonly associated with high-relief coral reefs or rocky substrate in clear waters to depths of 130 m. Generally, adults are most common at depths less than 100 m (Hill and Sadovy de Mitcheson 2013) except when at spawning aggregations where they are known to descend to depths of 255 m (Starr et al. 2007). Nassau grouper form spawning aggregations at predictable locations around the winter full moons, or between full and new moons (Smith 1971, Colin 1992, Tucker et al. 1993, Aguilar-Perera 1994, Carter et al. 1994, Tucker and Woodward 1994). The most serious threats to the status of Nassau grouper today are fishing at spawning aggregations and inadequate law enforcement protecting spawning aggregations in many foreign nations. There are no known spawning aggregations within the South Atlantic Region.

Of the 3 basic types of gear used in the South Atlantic snapper grouper fishery by commercial and/or recreational fishers (i.e., hook-and-line gear, spear/powerheads, and black sea bass pots), we believe only snapper grouper hook-and-line gear may adversely affect smalltooth sawfish and Nassau grouper. Interactions with smalltooth sawfish are limited to the coast of Florida; and are quite rare. In the 2016 Opinion, NMFS anticipates only 8 smalltooth sawfish interactions every three years in all snapper grouper hook-and-line-gear components combined and they are anticipated to all be non-lethal. Nassau grouper incidental captures appear to be more frequent. Farmer (2016) estimated that over the last 10 years, a total of approximately 1,387 Nassau grouper have been captured annually in the fishery. Based on an estimated 20% mortality rate, Farmer (2016) estimated an annual average expected mortality of approximately 282 fish. Future anticipated captures and mortalities are expected to remain at these same levels.

Giant Manta Ray - *Manta birostris*

Giant manta rays are circumglobal in range, but within this broad distribution, individual populations are scattered and highly fragmented (CITES 2013). The giant manta ray can be found in all ocean basins. In terms of range, within the Northern Hemisphere, the species has been documented as far north as southern California and New Jersey on the United States west and east coasts, respectively (CITES 2013; Gudger 1922; Kashiwagi et al. 2010; Moore 2012). Clark (2010) suggests that giant manta rays may forage in less productive pelagic waters and conduct seasonal migrations following prey abundance. Satellite tracking studies using pop-up satellite archival tags registering movements of the giant manta ray from the Yucatan, Mexico, into the Gulf of Mexico (Gulf) (448 km) (Marshall et al. 2011a). Despite this large range, sightings are often sporadic. The timing of these sightings also varies by region (for example,

the majority of sightings in Brazil occur during June and September, while in New Zealand sightings mostly occur between January and March) and seems to correspond with the movement of zooplankton, current circulation and tidal patterns, seawater temperature, and possibly mating behavior (Armstrong et al. 2016; Couturier et al. 2012; De Boer et al. 2015). However, a recent study by Stewart et al. (2016a) suggests that the species may not be as highly migratory as previously thought. Using pop-up satellite archival tags in combination with analyses of stable isotope and genetic data, the authors found evidence that giant manta rays may actually exist as well structured subpopulations off Mexico's coast that exhibit a high degree of residency (Stewart et al. 2016a). Additional research is required to better understand the distribution and movement of the species throughout its range. Within its range, the giant manta ray inhabits tropical, subtropical, and temperate bodies of water and is commonly found offshore, in oceanic waters, and near productive coastlines (Kashiwagi et al. 2011; Marshall et al. 2009). As such, giant manta rays can be found in cooler water, as low as 19 °C, although temperature preference appears to vary by region (Duffy and Abbott 2003; Freedman and Roy 2012; Graham et al. 2012; Marshall et al. 2009). Additionally, giant manta rays exhibit a high degree of plasticity in terms of their use of depths within their habitat, with tagging studies that show the species conducting night descents of 200-450 meters (m) depths (Rubin et al. 2008; Stewart et al. 2016b) and capable of diving to depths exceeding 1,000 m (A. Marshall et al. unpubl. data 2011 cited in Marshall et al. [2011a]). In areas where the species is not subject to fishing, populations may be stable. For example, Rohner et al. (2013) reported that giant manta ray sightings remained constant off the coast of Mozambique over a period of eight years. Given the migratory nature of this species, population declines in waters where the manta rays are protected have also been observed but attributed to overfishing of the species in adjacent areas within its large home range.

Although manta rays have been reported to live for at least 40 years (Kitchen-Wheeler 2013; Marshall and Bennett 2010; Marshall et al. 2011b) with low rates of natural mortality (Couturier et al. 2012), the time needed to grow to maturity and the low reproductive rates mean that a female will be able to produce only 5-15 pups in her lifetime (CITES 2013). Generation time (based on *M. alfredi* life history parameters) is estimated to be 25 years (Marshall et al. 2011a; Marshall et al. 2011b). In the Atlantic, very little information on *M. birostris* populations is available, but there is a known, protected population within the Flower Garden Banks National Marine Sanctuary in the Gulf. However, researchers are still trying to determine whether the manta rays in this area are only giant manta ray individuals or potentially also comprise individuals of a new, undescribed species (Hinojosa-Alvarez et al. 2016; Marshall et al. 2009). With populations potentially ranging from around 100 to 1,500 individuals (see Table 4 in Miller and Klimovich [2016]), their life history traits and productivity estimates, particularly their low reproductive output and sensitivity to changes in adult survival rates, giant manta ray populations are inherently vulnerable to depletions, with low likelihood of recovery.

The most serious threat to giant manta rays is overfishing. Manta rays are caught throughout their global warm water range in the Atlantic, Pacific, and Indian Oceans in commercial and artisanal fisheries. Fishermen targeting manta rays primarily use harpoons and nets, while significant manta ray bycatch occurs in purse seine, gillnet, and trawl fisheries targeting other species. The prebranchial appendages (or gill plates), which *Manta spp.* use to filter planktonic food from the water, are highly valued in international trade for use in traditional medicine. Cartilage and skins are also traded internationally while meat is consumed or used for bait locally. Due to their association with nearshore habitats, manta rays are at elevated risk for exposure to a variety of contaminants and pollutants, including brevetoxins,

heavy metals, polychlorinated biphenyls, and plastics. Many pollutants in the environment have the ability to bioaccumulate in fish species, however, only a few studies have specifically examined the accumulation of heavy metals in the tissues of manta rays (Essumang 2010; Ooi et al. 2015).

Plastics within the marine environment may also be a threat to the giant manta ray, as the animals ingest microplastics (through filter feeding) or become entangled in plastic debris, potentially contributing to increased mortality rates. Because giant manta rays are migratory and considered ecologically flexible (e.g., low habitat specificity), they may be less vulnerable to the impacts of climate change compared to other sharks and rays (Chin et al. 2010). However, as giant manta rays frequently rely on coral reef habitat for important life history functions (e.g., feeding, cleaning) and depend on planktonic food resources for nourishment, both of which are highly sensitive to environmental changes (Brainard et al. 2011; Guinder and Molinero 2013), climate change is likely to have an impact on the distribution and behavior of the giant manta ray. There is insufficient information to indicate how and to what extent changes in the reef community structure will affect the status of the giant manta ray.

Oceanic Whitetip Shark - *Carcharinus lonigmanus*

The oceanic whitetip is considered the only truly oceanic (i.e., pelagic) shark of its genus (Bonfil et al. 2008). They are distributed worldwide in epipelagic tropical and subtropical waters between 30° North latitude and 35° South latitude (Baum et al. 2006). In the western Atlantic, oceanic whitetips occur from Maine to Argentina, including the Caribbean and Gulf. The oceanic whitetip shark is a highly migratory species of shark that is usually found offshore in the open ocean, on the outer continental shelf, or around oceanic islands in deep water, occurring from the surface to at least 152 m depth. It has a clear preference for open ocean waters between 10° South latitude and 10° North latitude (Backus et al. 1956; Bonfil et al. 2008; Compagno 1984; Strasburg 1958). The species can be found in water temperatures between 15 °C and 28 °C, but it exhibits a strong preference for the surface mixed layer in water with temperatures above 20 °C, and is considered a surface-dwelling shark. Little is known about the movement or possible migration paths of the oceanic whitetip shark. Although the species is considered highly migratory and capable of making long distance movements, tagging data provides evidence that this species also exhibits a high degree of philopatry (i.e., site fidelity) in some locations. To date, there have been three tagging studies conducted on oceanic whitetip sharks in the Atlantic. Mark recapture data (number tagged=645 and recaptures=8) from the NMFS Cooperative Shark Tagging Program between 1962 and 2015 provide supporting evidence that the range of movement of oceanic whitetip sharks is large, with potential for transatlantic movements (Kohler et al. 1998; NMFS unpublished data).

The oceanic whitetip has an estimated maximum age of 17 years, with confirmed maximum ages of 12 and 13 years in the North Pacific and South Atlantic, respectively (Lessa et al. 1999; Seki et al. 1998). However, other information from the South Atlantic suggests the species likely lives up to around 20 years old based on observed vertebral ring counts (Rodrigues et al. 2015). Sexual maturity is estimated to occur at ages of 6-7 years and the gestation period is 10-12 months. The number of pups in a litter ranges from 1-14 (mean=6) (Bonfil et al. 2008; Compagno 1984; IOTC 2015; Seki et al. 1998). Oceanic whitetip sharks are considered to have low genetic diversity and rank the fourth lowest in global mtCR genetic diversity (Ruck 2016). Ruck (2016) also notated that the relatively low mtDNA genetic diversity raises potential concern for the future genetic health of the species. Furthermore, Camargo et al. (2016) observed low levels of genetic variability for the species throughout his study area, and noted that these low genetic variability rates may represent a risk to the adaptive potential of the species leading to a

weaker ability to respond to environmental changes (Camargo et al. 2016). Overall, the best available data indicate that the oceanic whitetip shark is a long-lived species (at least 20 years) and can be characterized as having relatively low productivity (based on the Food and Agriculture Organization of the United Nations productivity indices for exploited fish species, where $r < 0.14$ is considered low productivity), making them generally vulnerable to depletion and potentially slow to recover from overexploitation.

Currently, the most significant threat to oceanic whitetip sharks is mortality in commercial fisheries, largely driven by demand of the international shark fin trade, bycatch related mortality, as well as illegal, unreported, and unregulated fishing. Although generally not targeted, oceanic whitetip sharks are frequently caught as bycatch in many fisheries, including pelagic longline fisheries targeting tuna and swordfish, purse seine, gillnet, and artisanal fisheries. Oceanic whitetip sharks are also a preferred species for their large, morphologically distinct fins, as they obtain a high price in the Asian fin market. The oceanic whitetip shark's vertical and horizontal distribution significantly increases its exposure to industrial fisheries, including pelagic longline and purse seine fisheries operating within the species' core tropical habitat throughout its global range. The oceanic whitetip population size has likely declined significantly in the South Atlantic region due to historical exploitation of the species since the onset of industrial fishing; however, results of the extinction risk analysis team's analysis show that the oceanic whitetip shark population in the South Atlantic region has potentially stabilized since the 1990s/early 2000s (Young et al. 2016). The potential stabilization of oceanic whitetip sharks occurred concomitantly with the first Federal Fishery Management Plan for Sharks in the Northwest Atlantic Ocean and Gulf of Mexico, which directly manages oceanic whitetip shark under the pelagic shark group, and includes regulations on trip limits and quotas.

3.3 Economic Environment

3.3.1 Economic Description of the Commercial Sector

3.3.1.1 Introduction

In 2015, the U.S. seafood industry, which here includes the commercial marine fishing sector, seafood processors and dealers, seafood wholesalers and distributors, importers, and seafood retailers, supported approximately1.2 million full- and part-time jobs and generated $144.2 billion in sales, $39.7 billion in income, and $60.6 billion in value added impacts nationwide (NMFS FEUS 2015, with imports). The nation’s commercial fishing sector landed 9.7 billion pounds of finfish and shellfish with a dockside (ex-vessel) value of $5.2 billion, and approximately 1.1% of those pounds were landed in the South Atlantic.

Commercial fishermen in the South Atlantic Region landed approximately 106.4 million pounds of finfish and shellfish with a dockside value (revenue) of approximately $181.8 million in 2015 (NMFS FEUS 2015). Approximately 64% of the Region’s landings by weight and 66% by value were from shellfish landings. Blue crab and shrimp combined to represent approximately 53% of all South Atlantic landings by value and 60% by weight (**Table 3.3.1**).

Table 3.3.1. Key commercial species/species groups in the South Atlantic region, 2015.

Key Species/ Species Group	Dockside revenue (thousands)	Pounds landed (thousands)	Average price per pound	Percent of all dockside revenue	Percent of all pounds landed
Blue crab	$46,353	40,353	$1.15	25.5%	37.9%
Clams	$7,228	728	$9.65	3.9%	0.7%
Flounders	$13,202	4,180	$3.16	7.3%	3.9%
Groupers	$3,197	676	$4.73	1.8%	0.6%
King mackerels	$5,637	2,267	$2.49	3.1%	2.1%
Oysters	$6,643	1,049	$6.33	3.7%	1.0%
Shrimp	$50,299	22,943	$2.19	27.7%	21.6%
Snappers	$3,528	1,034	$3.41	1.9%	1.0%
Swordfish	$4,771	1,592	$3.00	2.6%	1.5%
Tunas	$4,634	2,076	$2.23	2.5%	2.0%
Total Key	$145,292	76,898		79.9%	72.3%
All Landings	$181,800	106,388		100.0%	100.0%

Source: NMFS FEUS 2015.

Groupers and snappers are among the ten key species/species groups in the Region. Landings of snappers accounted for 1.9% of the Region's dockside revenue in 2015 and landings of groupers accounted for 1.8% of that revenue (**Table 3.3.1**). The average annual dockside price of groupers in 2015 was $4.73 per pound and that of snappers was $3.41 per pound. In 2014, the average dockside price of groupers was $4.48 and for snappers was $3.36 (NMFS FEUS 2015). Note that these snappers and groupers groups may include species that are not federally managed, such as tiger grouper. Groupers and snappers are key species groups in all four of the Region's states: East Florida (FL), Georgia (GA), North Carolina (NC) and South Carolina (SC). (**Table 3.3.2**).

Table 3.3.2. Key species/species groups in states, 2015.

Key Species/ Species Group	Dockside revenue (thousands)				Percent all dockside revenue			
	East FL	GA	NC	SC	East FL	GA	NC	SC
Groupers	$878	Confidential	$1,120	$1,199	1.8%	Confidential	1.2%	5.6%
Snappers	$1,657	Confidential	$804	$1,067	3.4%	Confidential	0.9%	5.0%

Source: NMFS FEUS 2015.

3.3.1.2 South Atlantic Snapper Grouper Fishery

Commercial fishing vessels that participate in the federal snapper grouper fishery must have a federal snapper grouper permit. Additional information on those vessels and their landings of the snapper grouper fishery as a whole can be found in the Socio-Economic Profile of the Snapper Grouper Fishery in the South Atlantic Region and is incorporated herein by reference (http://safmc.net/download/SGProfileReport_May2018.pdf).

3.3.1.3 Red Grouper

The number of commercial vessels with a trip-limited or trip-unlimited snapper grouper permit that land red grouper represents a relatively small percentage of those vessels with the permit. From 2013 through 2017, an annual average of 32.4% of the permitted vessels landed red grouper (**Table 3.3.3**).

Table 3.3.3. Number and percentage of permitted vessels that landed red grouper, 2013-2017.

	Number of vessels with snapper grouper permit				
Year	Unlimited	225-lb	Total	Landed red grouper (RG)	Percentage landed RG
2013	592	129	721	251	34.8%
2014	584	125	709	245	34.6%
2015	571	121	692	223	32.2%
2016	565	116	681	206	30.3%
2017	554	114	668	200	29.9%
Average	573	121	694	225	32.4%

Source: NMFS SERO for permits and SEFSC Online Economic Query System, June 21, 2018, for permitted vessels that landed red grouper.

The numbers of permitted vessels and trips that landed red grouper annually declined from 2013 through 2017 (**Table 3.3.4**). Average landings (lbs gw) of red grouper per vessel and per trip also declined during that time.

Table 3.3.4. Commercial landings (lbs gw) of red grouper (RG) by permitted vessels and average landings per vessel and per trip, 2013 – 2017.

		Number of		Average RG landings (lbs gw)	
Year	RG landings (lbs gw)	Vessels	Trips	Per vessel annually	Per trip
2013	98,726	251	1,141	393	87
2014	74,462	245	1,190	304	63
2015	58,530	223	936	262	63
2016	38,064	206	788	185	48
2017	32,771	200	780	164	42
Average	60,511	225	967	262	60

Source: SEFSC Online Economic Query System, June 21, 2018.

Dockside revenue from trips that landed red grouper declined annually over the same 5-year period (**Table 3.3.5**). In 2013, red grouper accounted for 12.6% of real dockside revenue from all trips that landed red grouper and 3.0% of all trips made by the federally permitted vessels that landed red grouper that year. Five years later, those percentages were down to 7.5% and 1.3%, respectively.

Table 3.3.5. Real dockside revenue (2017$) from red grouper and other species landed by permitted vessels that landed red grouper, 2013-2017.

	Combined real dockside revenue (2017 $) for all permitted vessels with RG landings			
Year	From trips that landed RG			

	RG	Other species	Total	Percent RG	Total from non-RG & other region trips	Total all trips	Percent RG
2013	$443,189	$3,081,361	$3,524,550	12.6%	$11,046,094	$14,570,644	3.0%
2014	$341,341	$2,876,638	$3,217,979	10.6%	$12,853,529	$16,071,508	2.1%
2015	$273,161	$2,389,047	$2,662,208	10.3%	$11,397,052	$14,059,259	1.9%
2016	$179,425	$2,123,580	$2,303,004	7.8%	$11,421,502	$13,724,506	1.3%
2017	$149,690	$1,836,639	$1,986,329	7.5%	$9,836,684	$11,823,013	1.3%
Average	$277,361	$2,461,453	$2,738,814	9.8%	$11,310,972	$14,049,786	1.9%

Source: SEFSC Online Economic Query System, June 21, 2018, and BEA for GDP implicit price deflator.

Average dockside revenue from red grouper landings per vessel and per trip vary across the states. The average trip by a North Carolina or South Carolina vessel landed over $400 of red grouper, whereas the average trip by a Florida/Georgia vessel landed $246 of red grouper (**Table 3.3.6**).

Table 3.3.6. Average real dockside revenue (2017$) from red grouper per vessel and per trip, 2013-2017.

	Dockside revenue (2017 $) from red grouper landings					
	Average Annual per Vessel			Average per Trip		
Year	FL + GA*	NC	SC	FL + GA*	NC	SC
2013	$752	$3,526	$3,356	$220	$556	$627
2014	$1,156	$3,247	$2,266	$295	$453	$484
2015	$1,056	$2,532	$1,877	$294	$433	$483
2016	$588	$1,466	$1,479	$180	$298	$370
2017	$905	$1,236	$536	$241	$265	$181
Average	$891	$2,401	$1,903	$246	$401	$429

Source: SEFSC Online Economic Query System, June 21, 2018, and BEA for GDP implicit price deflator.
*Georgia combined with Florida to not disclose confidential information.

Red grouper landings represent the largest percentage of total annual revenue for vessels that make their landings in North Carolina (**Table 3.3.7**). Note that the relative importance of red grouper has declined annually in both North and South Carolina during from 2013 through 2017.

Table 3.3.7. Dockside revenue from red grouper as average percentage of total dockside revenue per vessel, 2013-2017.

	Red grouper as percentage of total revenue		
Year	FL + GA*	NC	SC
2013	1.2%	7.9%	3.1%
2014	1.6%	5.9%	2.3%
2015	1.6%	4.9%	1.7%
2016	0.9%	2.5%	1.3%
2017	1.5%	2.1%	0.6%
Average	1.3%	4.7%	1.8%

Source: SEFSC Online Economic Query System, June 21, 2018.
*Georgia combined with Florida to not disclose confidential information.

Commercial landings of red grouper generate economic impacts to the nation, such as jobs and income. Those impacts declined from 2013 through 2017 as landings of red grouper declined (**Table 3.3.8**). On average, however, annual landings of red grouper by permitted vessels generated 37 part-time and full-time jobs, approximately $1.03 million in income, $1.46 million in value-added, and $2.81 million in sales impacts annually (2017 $).

Table 3.3.8. Economic Impacts to the nation from landings of red grouper by permitted vessels, 2013 – 2017.

Year	Dockside revenue from RG (2017 $)	Jobs	Thousands (2017 $)		
			Income	Value-Added	Sales
2013	$443,189	58	$1,681	$2,376	$4,580
2014	$341,341	45	$1,272	$1,798	$3,465
2015	$273,161	36	$1,007	$1,424	$2,743
2016	$179,425	24	$654	$923	$1,779
2017	$149,690	20	$536	$757	$1,458
Average	$277,361	37	$1,030	$1,456	$2,805

Source: Estimates of economic impacts calculated by NMFS SERO using model developed for NMFS (2017) and BEA for GDP implicit price deflator.

Commercial landings of South Atlantic red grouper by permitted vessels vary considerably by state. Landings declined annually in both North and South Carolina, but did not follow that trend in Florida from 2013 through 2017 (**Figure 3.3.1**). In 2017, Florida ranked first among the states in landings of red grouper from the South Atlantic. Commercial landings of Gulf red grouper in Florida, however, dwarf landings of South Atlantic red grouper in the state (**Figure 3.3.2**).

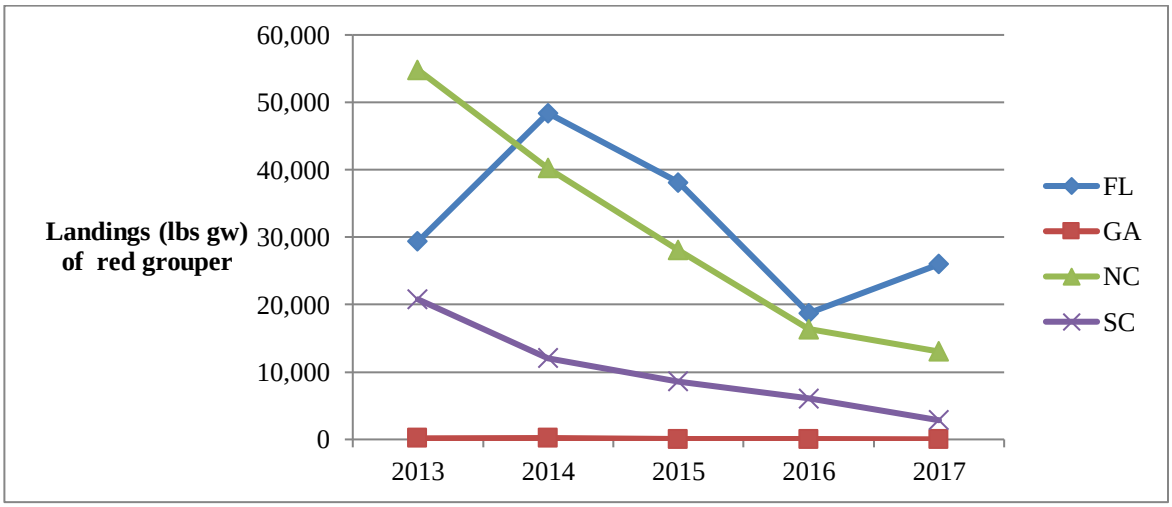

Figure 3.3.1. Landings of red grouper by permitted vessels by state, 2013 – 2017.
Source: SEFSC Online Economic Query System, June 21, 2018.

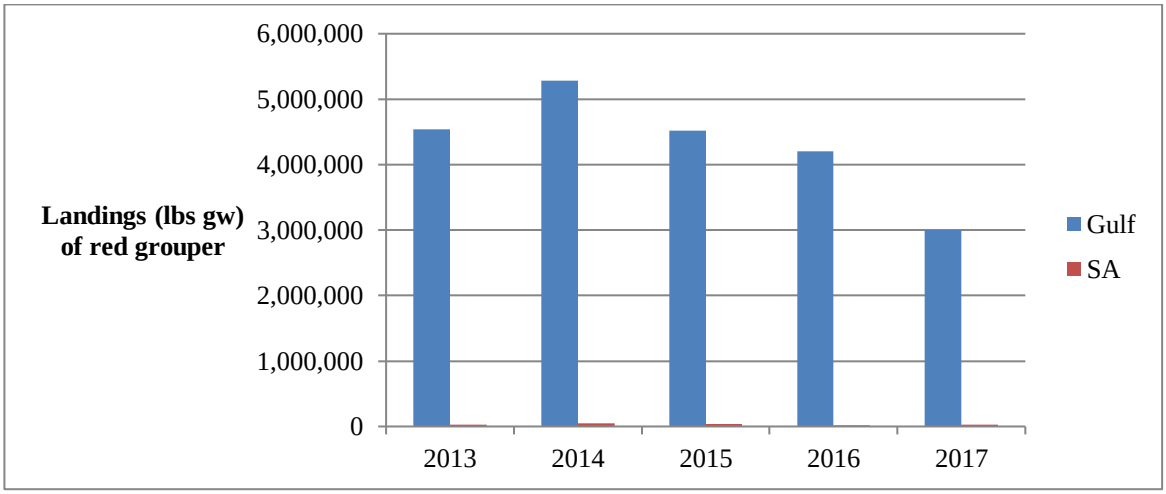

Figure 3.3.2. Commercial landings (lbs gw) of Gulf and South Atlantic red grouper in Florida, 2013-2017. Source: SEFSC Online Economic Query System, June 18, 2018.

On average, hook-and-line gears combined to account for 82.7% of annual landings and 73.6% of annual trips by permitted vessels that landed red grouper from 2013 through 2017 (**Tables 3.3.9** and **3.3.10**). Electric hook-and-line (bandit) gear was first by both percentage of landings (55.5%) and percentage of trips (42.1%).

Table 3.3.9. Percentage of red grouper landings (lbs gw) by gear, 2013-2017.

	Percentage of red grouper landings (lbs gw)						
	Hook and Line			Diving			
Year	Hand	Electric	Trolling	Spear	Power	Other	Total
2013	19.3%	67.6%	0.1%	10.0%	0.7%	2.3%	100.0%
2014	24.0%	60.2%	0.2%	12.6%	0.8%	2.2%	100.0%
2015	22.9%	60.4%	0.2%	15.0%	0.9%	0.5%	100.0%
2016	32.8%	48.3%	0.1%	16.8%	1.1%	0.7%	100.0%
2017	36.0%	41.2%	0.4%	20.7%	0.6%	1.0%	100.0%
Average	27.0%	55.5%	0.2%	15.1%	0.8%	1.3%	100.0%

Source: SEFSC Online Economic Query System, June 21, 2018.

Table 3.3.10. Percentage of trips that landed red grouper by gear, 2013-2017.

	Percentage of trips with red grouper landings						
	Hook and Line			Diving			
Year	Hand	Electric	Trolling	Spear	Power	Other	Total
2013	25.6%	49.9%	0.4%	19.7%	2.5%	1.9%	100.0%
2014	30.7%	41.6%	0.7%	21.6%	2.8%	2.7%	100.0%
2015	26.4%	41.5%	0.6%	26.2%	3.1%	2.2%	100.0%
2016	35.7%	40.5%	0.6%	19.3%	1.8%	2.2%	100.0%
2017	36.3%	36.9%	0.6%	21.5%	1.4%	3.2%	100.0%
Average	30.9%	42.1%	0.6%	21.7%	2.3%	2.4%	100.0%

Source: SEFSC Online Economic Query System, June 21, 2018.

Any permitted vessel that lands over 225 lbs gw of snapper grouper species must have a trip-unlimited permit, and from 2013 through 2017 an average of 4.8% of annual trips and 11.0% of permitted vessels landed more than 225 lbs gw of red grouper (**Table 3.3.11**). Note that both the percentages of trips and vessels that landed over 225 lbs declined annually after 2013. The majority of trips and vessels landed no more than 75 lbs gw of red grouper per trip (**Tables 3.3.12** and **3.3.13**).

Table 3.3.11. Percentages of trips and vessels that landed over 225 lbs gw of red grouper, 2013-2017.

	Number that landed red grouper				Percentage over 225 lbs gw	
	Trips		Vessels			
Year	Over 225 lbs gw	Total	Over 225 lbs gw	Total	Trips	Vessels
2013	117	1,141	47	251	10.3%	18.7%
2014	64	1,190	31	245	5.4%	12.7%
2015	39	936	21	223	4.2%	9.4%
2016	17	788	14	206	2.2%	6.8%
2017	14	780	11	200	1.8%	5.5%
Average	50	967	25	225	4.8%	11.0%

Source: SEFSC Online Economic Query System, June 27, 2018.

Table 3.3.12. Percentages of trips by landings (lbs gw) of red grouper, 2013-2017.

	Percentage of trips by landings (lbs gw) of red grouper					
Year	1 – 75	76-100	101 - 150	151 - 200	201+	Total
2013	69.7%	6.6%	6.3%	5.8%	11.7%	100.0%
2014	76.7%	6.1%	6.6%	3.9%	6.6%	100.0%
2015	76.7%	6.4%	7.4%	3.5%	6.0%	100.0%
2016	80.7%	6.2%	7.2%	2.4%	3.4%	100.0%
2017	83.2%	6.4%	5.5%	2.7%	2.2%	100.0%
Average	77.4%	6.3%	6.6%	3.7%	6.0%	100.0%

Source: SEFSC Online Economic Query System, June 27, 2018.

Table 3.3.13. Percentages of vessels by landings (lbs gw) of red grouper per trip, 2013-2017.

	Percentage of vessels by landings (lbs gw) of red grouper					
Year	1 – 75	76-100	101 - 150	151 - 200	201+	Total
2013	57.8%	6.0%	8.4%	7.6%	20.3%	100.0%
2014	66.9%	5.7%	8.2%	5.3%	13.9%	100.0%
2015	65.9%	3.6%	11.2%	5.4%	13.9%	100.0%
2016	70.4%	6.3%	8.7%	4.9%	9.7%	100.0%
2017	74.5%	6.5%	7.5%	5.0%	6.5%	100.0%
Average	67.1%	5.6%	8.8%	5.6%	12.9%	100.0%

Source: SEFSC Online Economic Query System, June 27, 2018.

There are differences in the average quantities of red grouper landed per trip by gear. For example, the average trip by a vessel that used electric hook-and-line gear landed 81 lbs gw of red grouper, whereas the average trip by a vessel that used trolling hook-and-line gear landed 23 lbs gw (**Table 3.3.14**).

Table 3.3.14. Average landings (lbs gw) of red grouper per trip by gear, 2013-2017.

Year	Average landings (lbs gw) per trip by gear used						
	Hook and Line			Diving			
	Hand	Electric	Trolling	Spear	Power	Other	All
2013	65	117	36	44	25	102	87
2014	49	91	19	37	19	50	63
2015	54	91	24	36	18	14	63
2016	44	58	11	42	31	16	48
2017	42	47	27	40	18	14	42
Average	51	81	23	40	22	39	60

Source: SEFSC Online Economic Query System, June 27, 2018.

Many vessels that harvest red grouper use more than one gear during the year. Approximately 86% of the vessels used hook-and-line gear and one in five used spear from 2013 through 2017 when harvesting red grouper (**Table 3.3.15**).

Table 3.3.15. Average percentage of vessels that landed red grouper by gear, 2013-2017.

Year	Percentage of vessels that landed red grouper by gear					
	Hook and Line			Diving		Other
	Hand	Electric	Trolling	Spear	Power	
2013	43.8%	41.0%	1.6%	17.9%	2.4%	3.2%
2014	45.7%	39.2%	2.4%	22.9%	3.3%	2.9%
2015	41.3%	41.7%	2.2%	22.4%	2.7%	1.3%
2016	45.6%	37.4%	1.9%	18.4%	1.9%	1.9%
2017	48.5%	37.5%	2.0%	19.5%	1.5%	3.0%
Average	45.0%	39.4%	2.0%	20.2%	2.4%	2.5%

Source: SEFSC Online Economic Query System, June 28, 2018.

The highest annual average number of trips that landed more than 200 lbs gw of red grouper were those made by vessels using electric hook-and-line gear (**Table 3.3.16**). No trips made by vessels that used either trolling hook-and-line gear or power diving from 2013 through 2017 landed more than 100 lbs gw of red grouper.

Table 3.3.16. Average annual number of trips that landed red grouper by pounds landed and by gear, 2013-2017.

Gear		Average annual number of trips by landings (lbs gw) of red grouper					
		1 – 75	76-100	101 - 150	151 - 200	201+	Total
	Hand H&L	241	15	17	7	14	294

Hook & Line	Electric H&L	273	32	39	24	44	412
	Troll H&L	5	1	0	0	0	6
Diving	Spear	180	13	8	6	3	209
	Power	22	1	0	0	0	23
Other		21	0	1	1	1	23
All combined		742	61	64	37	62	967

Source: SEFSC Online Economic Query System, June 28, 2018.

Red grouper's average contribution to total annual revenue varies by gear. For example, dockside revenue from red grouper landings represented, on average, 4.5% of total revenue for vessels that used spear versus 2.7% for those that used electric hook-and-line gear (**Table 3.3.17**).

Table 3.3.17. Dockside revenue from red grouper as percentage of total revenue by gear, 2013-2017.

	Percentage of total revenue from red grouper landings					
	Hook and Line			**Diving**		
Year	**Hand**	**Electric**	**Trolling**	**Spear**	**Power**	**Other**
2013	1.9%	4.9%	3.5%	5.8%	1.3%	1.1%
2014	1.5%	3.2%	0.7%	4.4%	1.1%	0.5%
2015	1.2%	2.8%	1.1%	4.7%	1.1%	0.2%
2016	1.2%	1.5%	0.6%	4.1%	1.0%	0.2%
2017	1.4%	1.2%	1.5%	3.5%	0.5%	0.3%
Average	1.4%	2.7%	1.5%	4.5%	1.0%	0.5%

Source: SEFSC Online Economic Query System, June 28, 2018.

During January through April, no person may sell or purchase a red grouper harvested from or possessed in the South Atlantic EEZ or, if harvested or possessed by a vessel for which a valid Federal commercial permit for South Atlantic snapper-grouper has been issued, harvested from the South Atlantic. This prohibition has been in place since mid-2009 (Amendment 16). Landings of red grouper by permitted vessels declined after 2008 in the Carolinas (**Figure 3.3.3**).

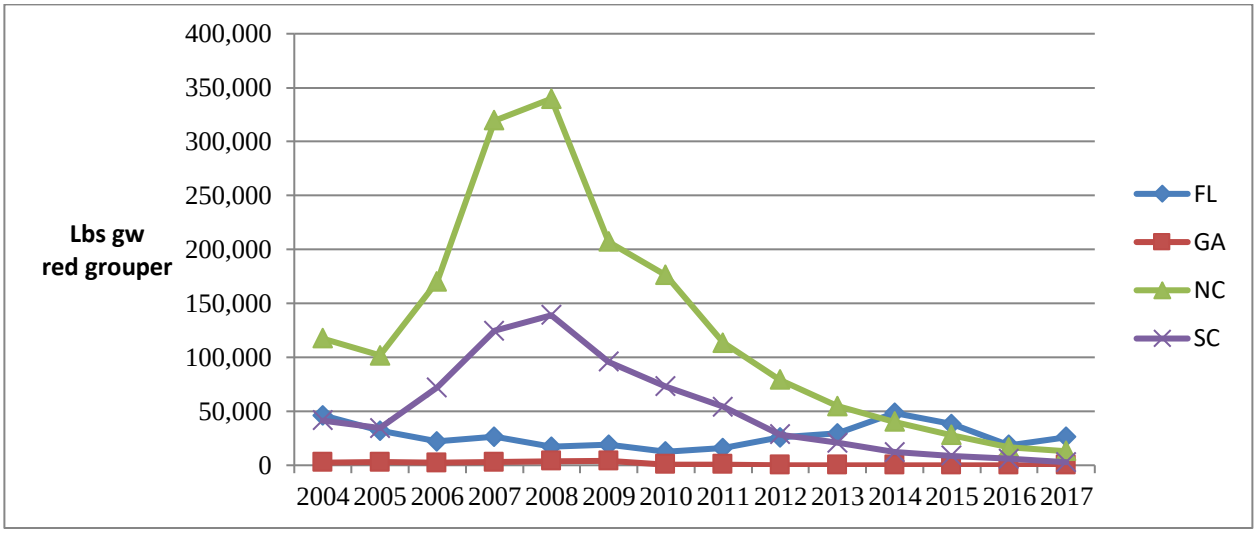

Figure 3.3.3. Landings (lbs gw) of South Atlantic red grouper by federally permitted vessels by state, 2004 – 2017. Source: SEFSC Online Economic Query System, June 25, 2018.

3.3.2 Economic Description of the Recreational Sector

3.3.2.1 Introduction

In 2015, there were approximately 8.9 million recreational saltwater anglers across the U.S. who took 60.9 million saltwater fishing trips around the country. These anglers spent $4.5 billion on fishing trips and $24.3 billion on durable fishing-related equipment. Recreational fishing activity supported 439,242 jobs nation-wide (FEUS 2015). The top two of the ten key species and species groups are seatrouts (approximately 28 million caught) and Atlantic croaker and spot (approximately 26 million caught). None of the national key species or species groups are within the South Atlantic snapper grouper fishery. The ten key species and species groups in the Region include one species from the snapper grouper fishery: black sea bass (FEUS 2015).

Approximately 4.6 million saltwater anglers made approximately 16.5 million saltwater trips in the South Atlantic in 2015 (**Table 3.3.18**). The approximately 8.6 million trips out of East Florida were made by approximately 1.8 million anglers and generated 35,523 jobs, approximately $4.0 billion in sales, $1.5 billion in income, and $2.4 billion in value added. The number of anglers, trips and the economic impacts of those trips for the other states in the region are included in the table.

Table 3.3.18. Anglers, angler trips, and economic impacts of trips in the South Atlantic.

State	Anglers	Trips	Jobs	Thousands		
				Sales	Income	Value added
East FL	1,820,701	8,633,661	35,523	$4,019,789	$1,515,254	$2,426,637
GA	231,026	590,129	1,433	$142,292	$58,661	$93,408
NC	1,547,964	4,645,660	14,163	$1,450,301	$559,858	$870,716
SC	1,032,831	2,670,024	6,900	$675,562	$245,272	$396,858

Total	4,632,522	16,539,474	

Sources: FEUS 2015.

Approximately 53% of the trips in the South Atlantic were by anglers from shore, 3% by anglers on for-hire fishing vessels, and 44% by those on private/rental vessels. Over half of these trips (approximately 8.6 million) were out of East Florida. North Carolina had the second largest number of angler trips with approximately 5 million (**Table 3.3.19**). Approximately 8% of anglers trips in the region occur in federal waters (**Table 3.3.20**).

Table 3.3.19. Angler trips in South Atlantic by area, 2015.

	2015 Angler Trips						
	Number				Percentage		
State	Shore	For-hire	Private/ Rental	Total	Shore	For-hire	Private/Rental
East FL	4,245,527	255,124	4,133,010	8,633,661	49.17%	2.95%	47.87%
GA	301,378	33,981	254,770	590,129	51.07%	5.76%	43.17%
NC	2,490,579	114,061	2,041,020	4,645,660	53.61%	2.46%	43.93%
SC	1,701,143	96,315	872,566	2,670,024	63.71%	3.61%	32.68%
Total	8,738,627	499,481	7,301,366	16,539,474	52.83%	3.02%	44.15%

Source: FEUS 2015.

Table 3.3.20. Number and percentage of angler trips in federal waters, 2015.

State	EEZ trips	Total trips	Percentage EEZ trips
East FL	950,651	8,633,661	11.0%
GA	26,325	590,129	4.5%
NC	300,787	4,645,660	6.5%
SC	68,619	2,670,024	2.6%
Total	1,346,382	16,539,474	8.1%

Source: NMFS Fisheries Statistics Division.

3.3.2.2 South Atlantic Snapper Grouper Fishery

Private or rented recreational fishing vessels are not required to have a federal permit to harvest snapper grouper species/species groups from the EEZ. Anglers aboard these vessels, however, must either be federally registered or licensed in states that have a system to provide complete information on the states' saltwater anglers to the national registry.

Any for-hire fishing vessel that takes anglers into the South Atlantic EEZ where anglers harvest snapper grouper species/species groups must have a charter/headboat permit, which is an open-access permit that is specifically assigned to that vessel. Since 2013, there has been a general increase in the number of vessels with the permit (**Table 3.3.21**). However, as of July 1, 2018, there were 1,690 vessels with the permit.

Table 3.3.21. Number of for-hire vessels with South Atlantic charter/headboat snapper grouper permit.

Year	Number of permitted for-hire vessels
2013	1,799
2014	1,727
2015	1,779
2016	1,867
2017	1,982
Average	1,831

Source: NMFS SERO.

As of July 1, 2018, approximately 91% of the South Atlantic charter/headboat permits were held by entities residing in a South Atlantic state (**Table 3.3.22**). Florida entities ranked first, followed in turn by North Carolina, South Carolina and Georgia.

Table 3.3.22. Number of for-hire vessels with South Atlantic charter/headboat snapper grouper permit.

State	SA SG Charter/Headboat Permits	
	Number	Percent
FL	999	59.1%
GA	59	3.5%
NC	305	18.0%
SC	172	10.2%
Other	155	9.2%
Total	1,690	100.0%

Source: NMFS SERO FOIA Page.

The actions of this regulatory amendment concern fishing for red grouper only. Consequently, the remainder of this section focuses exclusively on recreational fishing for red grouper in the Region.

Additional information on recreational landings and fishing for the snapper grouper fishery as a whole or the other species or complexes within it can be found in previous amendments, such as Amendment 13C (SAFMC 2006), Amendment 15A (SAFMC 2008a), Amendment 15B (SAFMC 2008b), Amendment 16 (SAFMC 2009a), Regulatory Amendment 9 (SAFMC 2011a), and Amendment 25 (SAFMC 2012), Regulatory Amendment 25 (2016), and are incorporated herein by reference.

3.3.2.3 Red Grouper

The recreational fishing year (season) for most species and species groups within the snapper grouper fishery runs from January 1 to December 31 every year. However, recreationally harvest and possession of red grouper or any other shallow water grouper is prohibited in federal waters from January 1 through April 30.

If recreational landings of red grouper reach or are projected to reach or exceed the recreational ACL, the season is closed. From 2012 through 2016, there were no early closures of the recreational season for red grouper because no more than 35.5% of the recreational ACL was landed annually during that 5-year

period (**Table 3.3.23**). Recreational landings declined in 2013 and 2014, but then increased in both 2015 and 2016.

Table 3.3.23. Recreational landings and ACL pounds whole weight (lbs ww) for red grouper, 2012 – 2016.

Year	Recreational landings (lbs ww) of red grouper		
	ACL	Landings	Percent ACL
2012	362,320	101,604	28.0%
2013	402,080	87,123	21.7%
2014	436,800	38,756	8.9%
2015	436,800	128,213	29.4%
2016	436,800	155,271	35.5%
2017	436,800	96,430	22.1%

Source: NMFS SERO ACL.

Recreational landings of red grouper tend to be minimal by comparison during the first two waves (January – February and March – April) before rising substantially during the third wave months of May and June, which are the first two months of the open federal season and illustrated in **Figure 3.3.4**. In the Carolinas, average landings in May represented approximately 4% of average annual landings from 2013 through 2017.

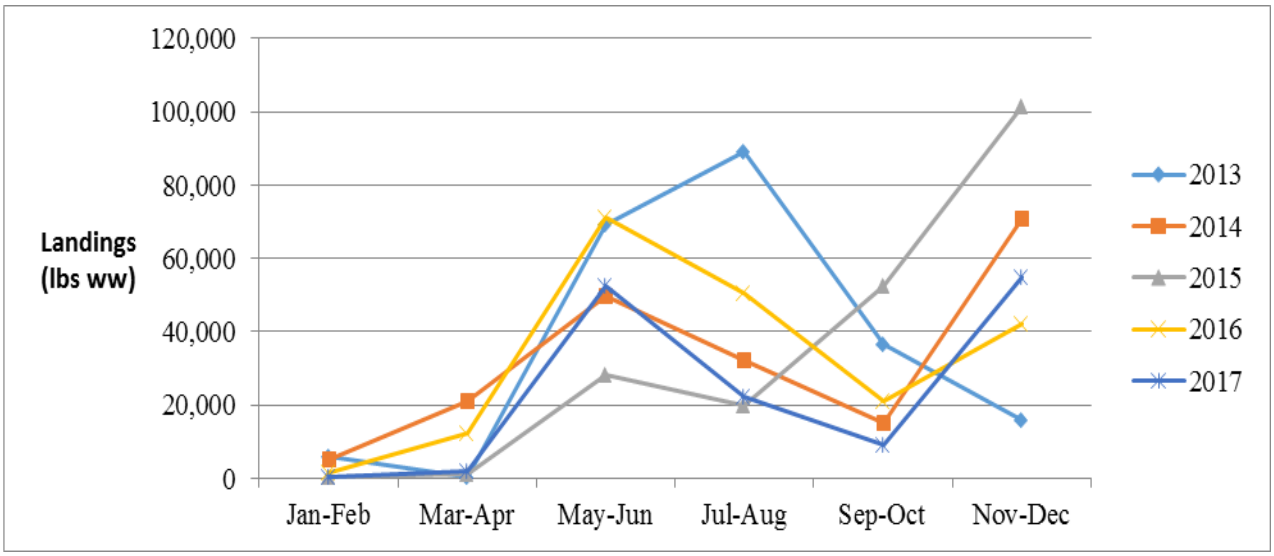

Figure 3.3.4. Recreational landings (lb gw) of red grouper from South Atlantic EEZ by wave,2016-2017.
Source: NMFS SERO ACL MRIP June 11, 2018.

Recreational saltwater fishing trips have associated expenses. These trip-related expenses can include bait, ice, charter fees, boat fuel, boat and equipment rentals, lodging, public and other vehicle transportation, access and parking, and food. There are also durable goods expenditures associated with recreational fishing, such as, but not limited to rods and reels, tackle, boat purchases and maintenance, boat accessories, and clothing. These expenditures represent only part of the value of the recreational fishing sector. Fish harvested by saltwater anglers for their own or family's consumption are not included in traditional economic (market) valuation of the recreational sector, although those fish harvested may

have substantial personal and social values, especially to the individuals and families that rely on recreationally caught fish and shellfish to feed themselves and their families throughout the year and especially at times of economic hardship. There is relaxation, camaraderie of being with family and friends, being out in nature, the thrill of adventure, and other factors that cause one to value recreational fishing beyond the expenses. One method used to put a dollar value on those values is determining saltwater angler's willingness to pay in excess of expenses, and that extra amount (above expenses) is termed consumer surplus. Estimates of consumer surplus from recreational fishing for red grouper are not available; however, there are estimates for grouper species in general. Carter and Liese (2012) estimated the value for catching and keeping a second grouper on an angler trip was $80.40 at 2003 prices, which is $105.14 at 2017 prices. The values of an additional grouper landed decreases for every additional one.

3.4 Social Environment

Commercial Fishing

Since 2001, South Atlantic Snapper Grouper Unlimited Permits and Snapper Grouper 225-pound Trip Limit Permits have shown a downward trend (**Figure 3.4.1**) as would be expected with a limited entry program in place since 1998 and a "2 for 1" requirement for new permits. That trend will likely continue as long as the criteria are a continued part of management for the snapper grouper commercial fishery. The decline in the number of permits has slowed in recent years but continues to trend lower with the number of unlimited permits in 2013 going from 593 to 554 in 2017 and limited permits dropping from 130 in 2013 to 114 in 2017.

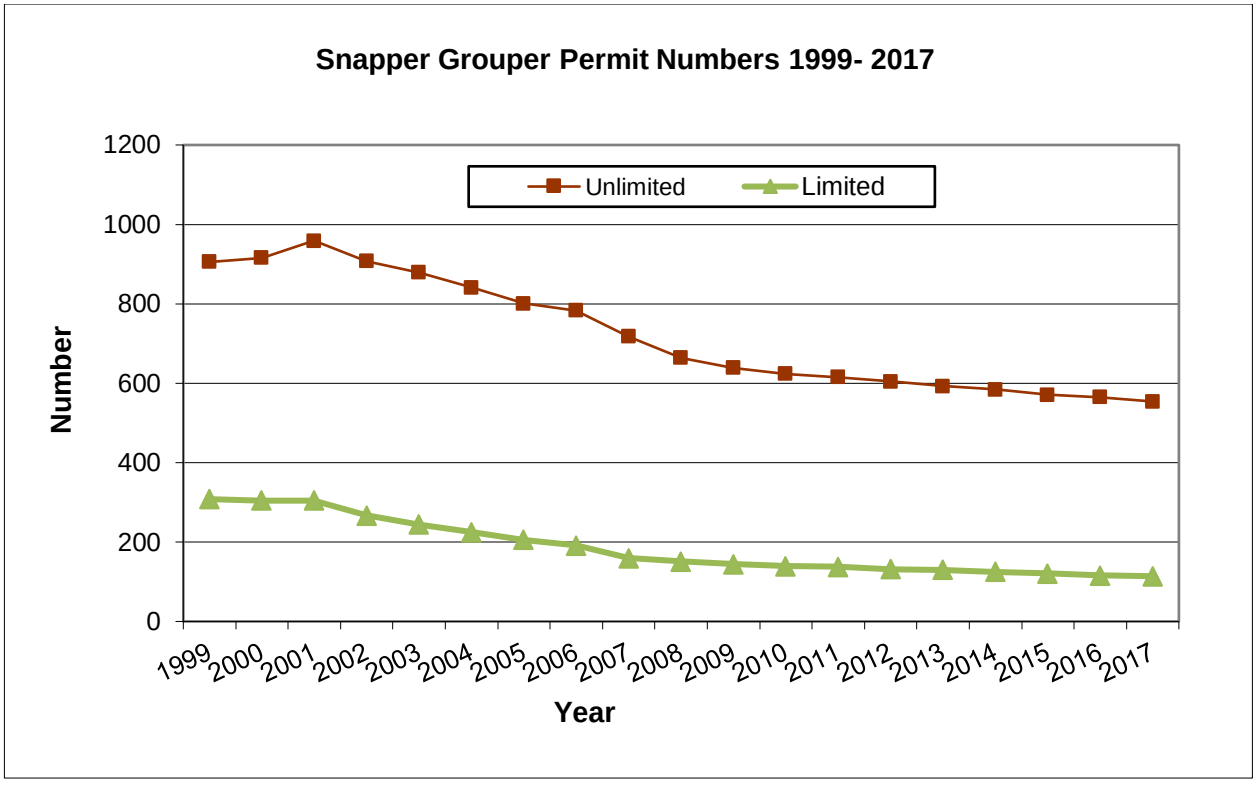

Figure 3.4.1. Snapper grouper Unlimited and 225-pound trip limit permits 1999-2016.

Source: NMFS SERO Permits (2017).

The geographical distribution of South Atlantic Snapper Grouper Unlimited and Limited Permits appears in **Figure 3.4.2**. There are several concentrations of unlimited permits (SG1) with the largest in the Florida Keys and a smaller concentration near Jacksonville, FL. The northern South Carolina coast and southern North Carolina coast have the second largest concentration of unlimited permits with a smaller concentration in the Outer Banks and Wanchese in North Carolina. Although not concentrated in any particular zip code, Florida's southeastern coast does have a considerable number of permits spread throughout many different zip codes. Limited (SG2) permits are concentrated in Southern Florida with the majority in the Florida Keys communities.

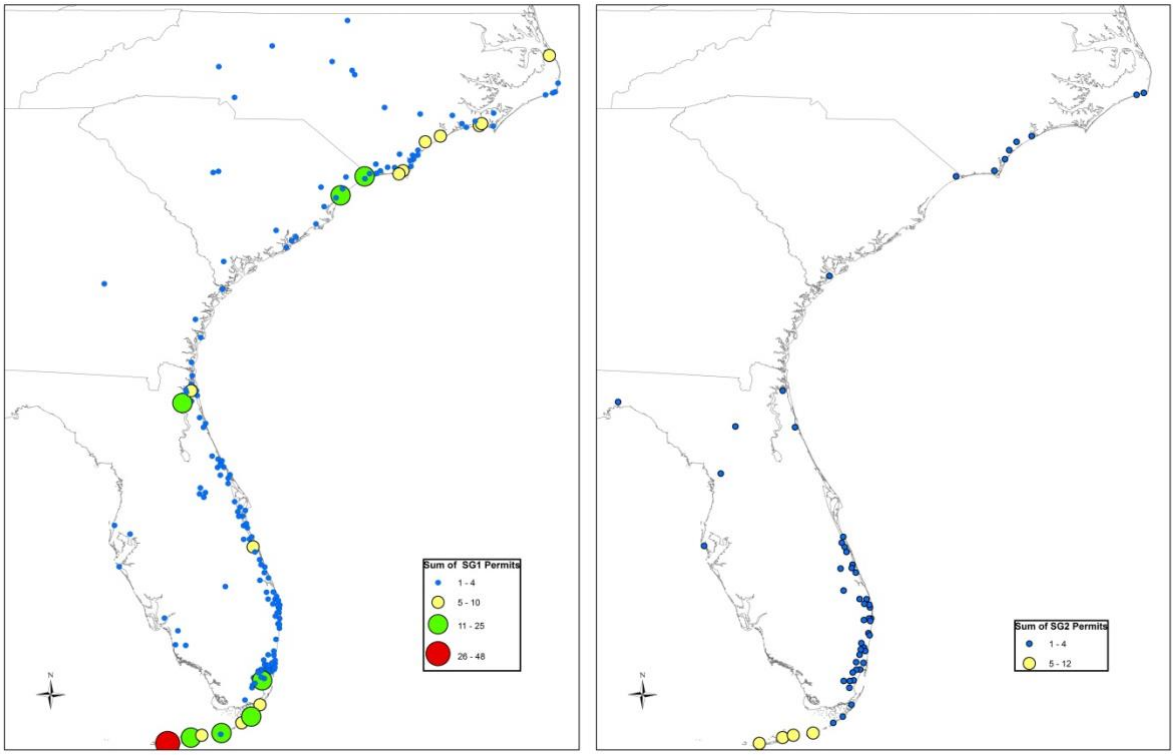

Figure 3.4.2. Snapper grouper unlimited (SG1) and limited (SG2) permits by owner's zip code.
Source: NMFS SERO Permits (2017).

A regional quotient (RQ) measure was used to identify commercial fishing involvement at the community level by species or species group. The RQ measures the relative importance of a given species or species group across all communities in the region and represents the proportional distribution of commercial landings. This proportional measure does not provide the actual number of pounds or the value of the catch; data that might be confidential at the community level. The RQ is calculated by dividing the total pounds (or value) of a species landed in a given community, by the total pounds (or value) for that species for all communities in the region. The measure is a way to quantify the importance of a particular species or species group to communities around the South Atlantic and suggest where impacts from management actions are more likely to be experienced. The time series for the describing the RQ was from 2010 to 2016. The data used for the RQ measure were assembled from the accumulated landings system (ALS), which includes commercial landings of all species from both state and federal

waters and is based on dealer reports. These data were converted to provide landings by (dealer's) address.

While most communities have demonstrated a fairly stable trend in their RQ for red grouper in **Figure 3.4.3**, Key West, FL has seen a rather steady rise in its landings of after 2010 and then a decrease in its RQ in 2013 with another rise in the latest years. Murrells Inlet, SC is ranked second and was ranked higher in 2013 and 2014 but has fallen in recent years. Winnabow, NC has seen a steady decline over the time period. Most other communities have seen a rather consistent RQ ranking through the time series.

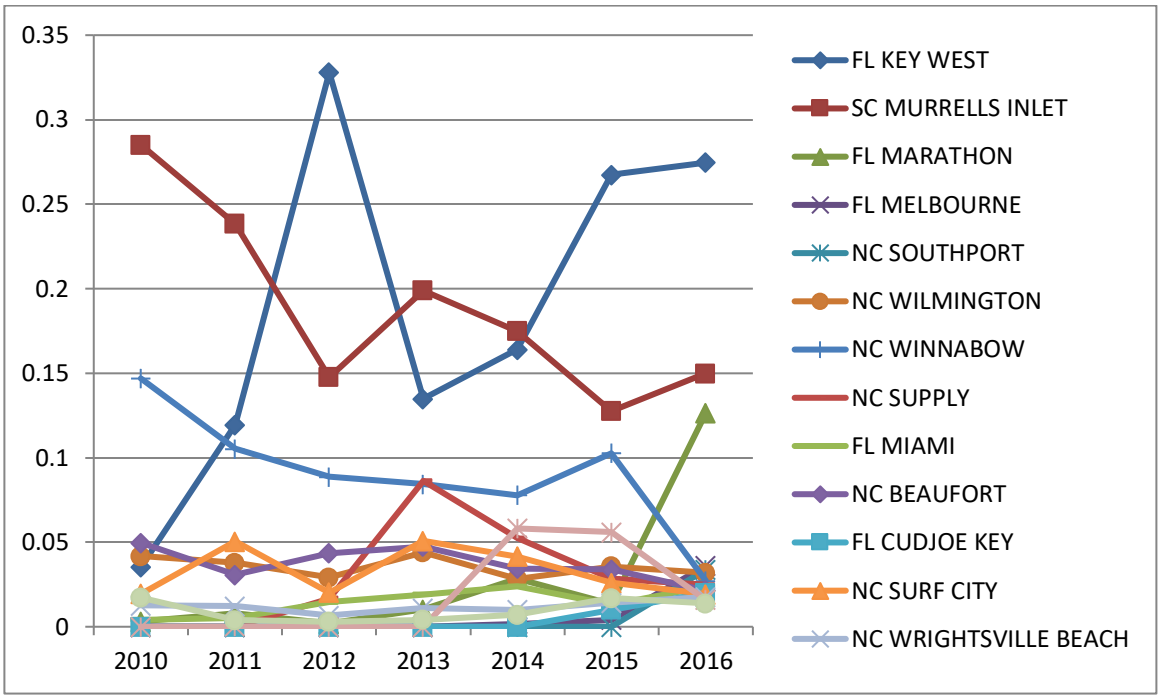

Figure.3.4.3. Red grouper community RQ for pounds from 2010 to 2016 ranked initially by 2016 top fifteen. Source: NMFS SERO ALS Database (with dealer address) (2017).

Commercial Fishing Engagement

While we can characterize those communities that have high regional quotients for landings and value, it is more difficult to characterize the fleet and its labor force regarding demographics and places of residence for captains and crew of vessels. There is little to no information on captains and crew, including demographic makeup of crew, so we are left with descriptions regarding the engagement and reliance of fishing communities and their social vulnerability. To further delineate which communities are more dependent upon fishing, a measure has been developed to gauge overall fishing engagement.

An index of existing permit and landings data was created to provide a more empirical measure of fishing dependence (Jacob et al. 2012; Colburn and Jepson 2013; Jepson and Colburn 2013). Fishing engagement uses the absolute numbers of permits, dealers, landings and value of landings to provide a more robust look at a community's dependence upon fishing.

Using a principal component and single solution factor analysis each community receives a factor score for each index to compare to other communities. Factor scores are represented by colored bars and are standardized, therefore the mean is zero. Two thresholds of 1 and ½ standard deviation above the mean are plotted onto the graphs to help determine thresholds for significance. Because the factor scores are standardized, a score above 1 is also above one standard deviation. The top 20 communities in **Figure 3.4.4** are all above the threshold of one standard deviation and therefore commercial fishing is likely to have a large impact on the local economy.

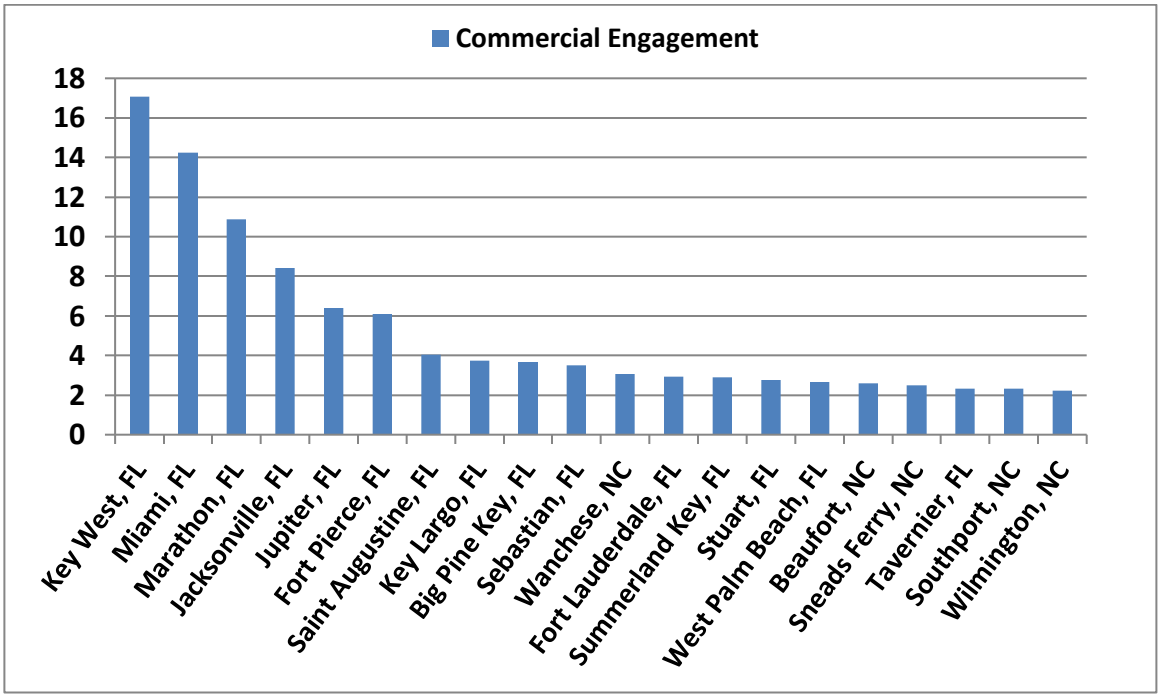

Figure.3.4.4. Top 20 commercial fishing communities as measured by overall commercial fishing engagement. Source: SERO, Community Social Vulnerability Indicators Database 2017 (American Community Survey 2010-2014).

Environmental Justice

Executive Order 12898 requires that federal agencies conduct their programs, policies, and activities in a manner to ensure individuals or populations are not excluded from participation in, or denied the benefits of, or subjected to discrimination because of their race, color, or national origin. In addition, and specifically with respect to subsistence consumption of fish and wildlife, federal agencies are required to collect, maintain, and analyze information on the consumption patterns of populations who principally rely on fish and/or wildlife for subsistence. This executive order is generally referred to as environmental justice (EJ).

In order to assess whether a community may be experiencing EJ issues, a suite of indices created to examine the social vulnerability of coastal communities (Colburn and Jepson 2012; Jacob et al. 2012) is presented in **Figures 3.4.5 - Figure 3.4.7** for some communities that appear in **Figure 3.4.2 - Figure 3.4.4**. All communities that have permits or landings do not always have census data associated with it to

create the vulnerability indices and therefore may not appear in figures. The three indices are poverty, population composition, and personal disruptions. The variables included in each of these indices have been identified as important components that contribute to a community's vulnerability. Indicators such as increased poverty rates for different groups, more single female-headed households and children under the age of 5, disruptions such as higher separation rates, higher crime rates, and unemployment all are signs of vulnerable populations. These indicators are closely aligned to previously used measures of EJ which used thresholds for the number of minorities and those in poverty. For those communities that exceed the threshold, it is expected that they would exhibit vulnerabilities to sudden changes or social disruption that might accrue from regulatory change.

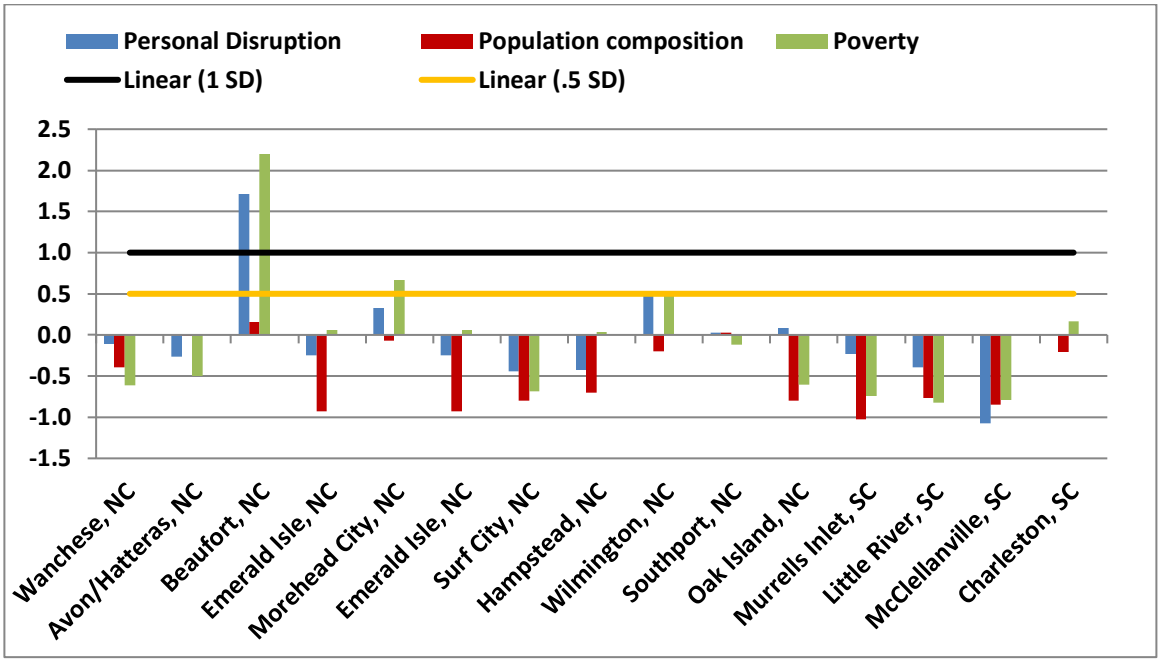

Figure.3.4.5. Social vulnerability indicators for selected NC/SC snapper grouper fishing communities. Source: SERO, Community Social Vulnerability Indicators Database 2017 (American Community Survey 2010-2014).

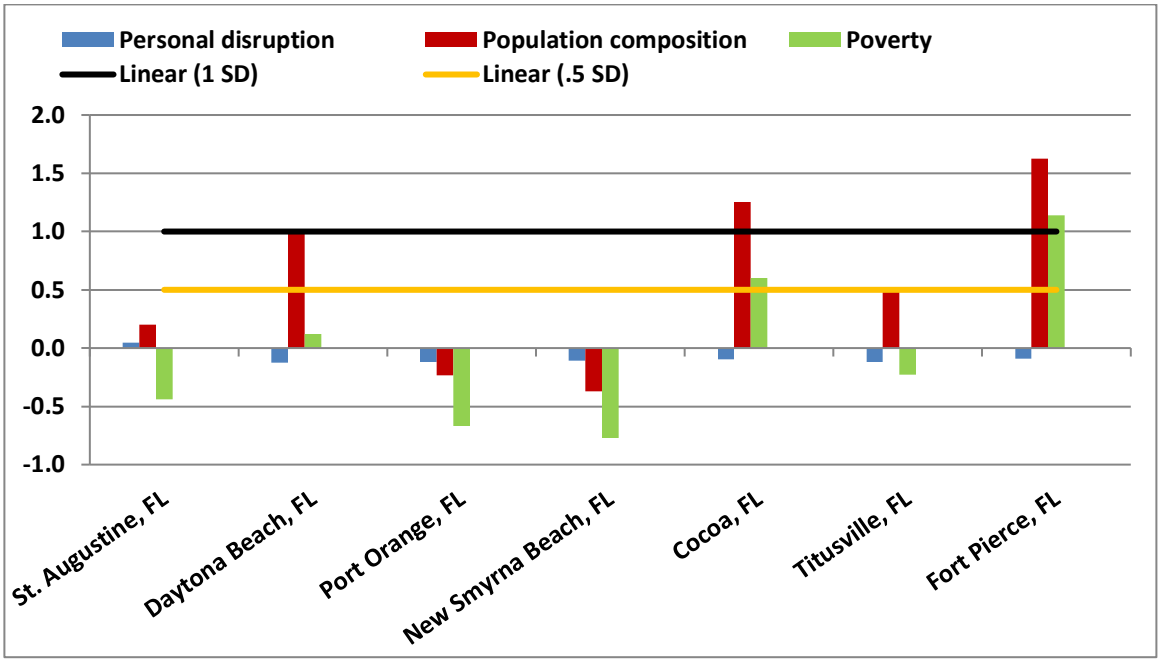

Figure.3.4.6. Social vulnerability indicators for selected Northern Florida snapper grouper fishing communities. Source: SERO, Community Social Vulnerability Indicators Database 2017 (American Community Survey 2010-2014).

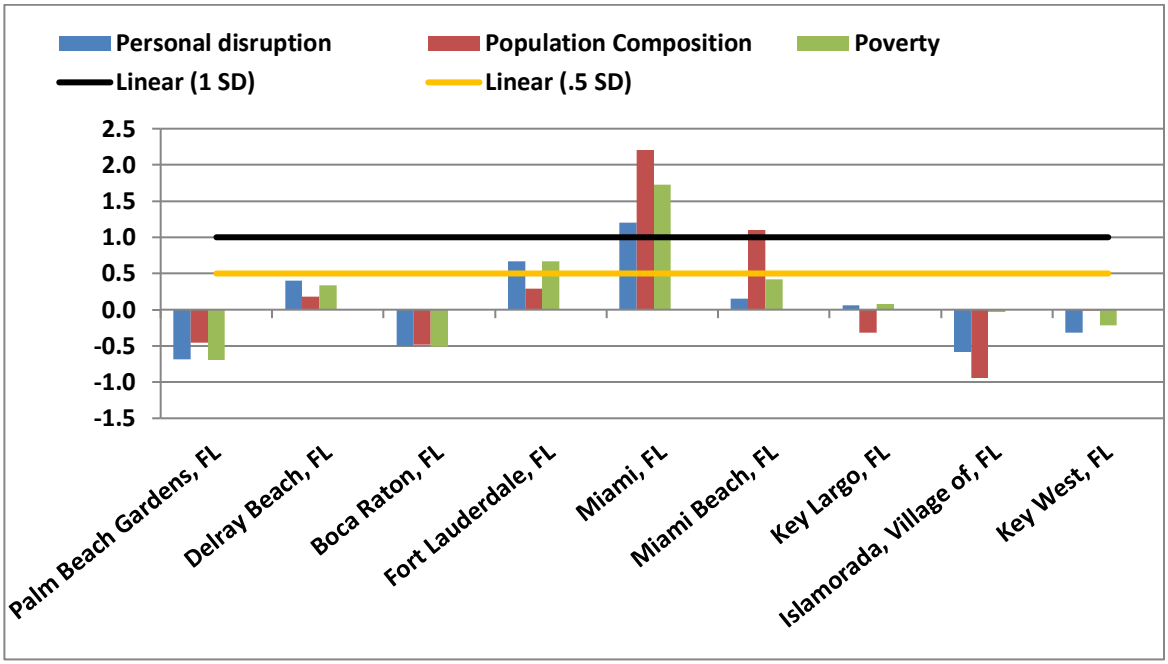

Figure.3.4.7. Social vulnerability indicators for selected Southern Florida snapper grouper fishing communities. Source: SERO, Community Social Vulnerability Indicators Database 2017 (American Community Survey 2010-2014).

Recreational Fishing

Recreational landings for included species and federal for-hire permits for South Atlantic snapper grouper are included by state to provide information on the geographic distribution of fishing involvement. Descriptions of the top recreational fishing communities in the South Atlantic based on recreational engagement are included, along with the distribution of federal for-hire permits for South Atlantic snapper grouper by community, top ranking communities by the number of federal for-hire permits for South Atlantic snapper grouper, and top communities with Southeast Headboat Survey (SRHS) landings by red grouper. Community level data are presented in order to meet the requirements of National Standard 8 of the Magnuson-Stevens Act, which requires the consideration of the importance of fishery resources to human communities when changes to fishing regulations are considered. Lastly, social vulnerability data are presented to assess the potential for environmental justice concerns. Additional information on the South Atlantic recreational snapper grouper fishery is provided in the Economic Environment in **Section 3.3**.

Landings by State

The greatest proportions of landings for the majority of red grouper are from waters adjacent to Florida and Georgia (**Table 3.4.1**).

Table 3.4.1. Recreational red grouper landings (ww) by species and by state for 2016 and 2017.

Year	Species	FLE/GA	NC	SC	Total
2016	red grouper	154,691	503	77	155,271
2017	red grouper	96,342	67	21	96,430

Source: SEFSC MRIP and MRFSS datasets.

Permits by State

In 2016, there were a total of 1,867 federal for-hire permits for South Atlantic snapper grouper (**Table 3.3.2.1**). The majority of permits are held by operators in Florida (58.9% in 2016), followed by North Carolina (17.8%), South Carolina (11.4%), other states (5.5%), Gulf states (3.7%), and Georgia (2.8%).

Recreational Communities

Landings for the recreational sector are not available by species at the community level; therefore, it is not possible with available information to identify communities as dependent on recreational fishing for specific species. Because limited data are available concerning how recreational fishing communities are engaged and reliant on specific species, indices were created using secondary data from permit and infrastructure information for the southeast recreational fishing sector at the community level (Jepson and Colburn 2013; Jacob et al. 2013). Recreational fishing engagement is represented by the number of recreational permits and vessels designated as "recreational" by homeport and owners address and recreational infrastructure (boat ramps and fishing piers). Fishing reliance includes the same variables as fishing engagement, divided by population. Factor scores of both engagement and reliance were plotted. Communities were analyzed in ranked order by recreational fishing engagement.

Figure 3.4.8 identifies the top 20 recreational communities located in the South Atlantic that are the most engaged and reliant on recreational fishing, in general. All included communities demonstrate high levels of recreational engagement. Five communities (Marathon, Florida; Islamorada, Florida; Hatteras,

North Carolina; Manteo, North Carolina; and Atlantic Beach, North Carolina) demonstrate high levels of recreational reliance.

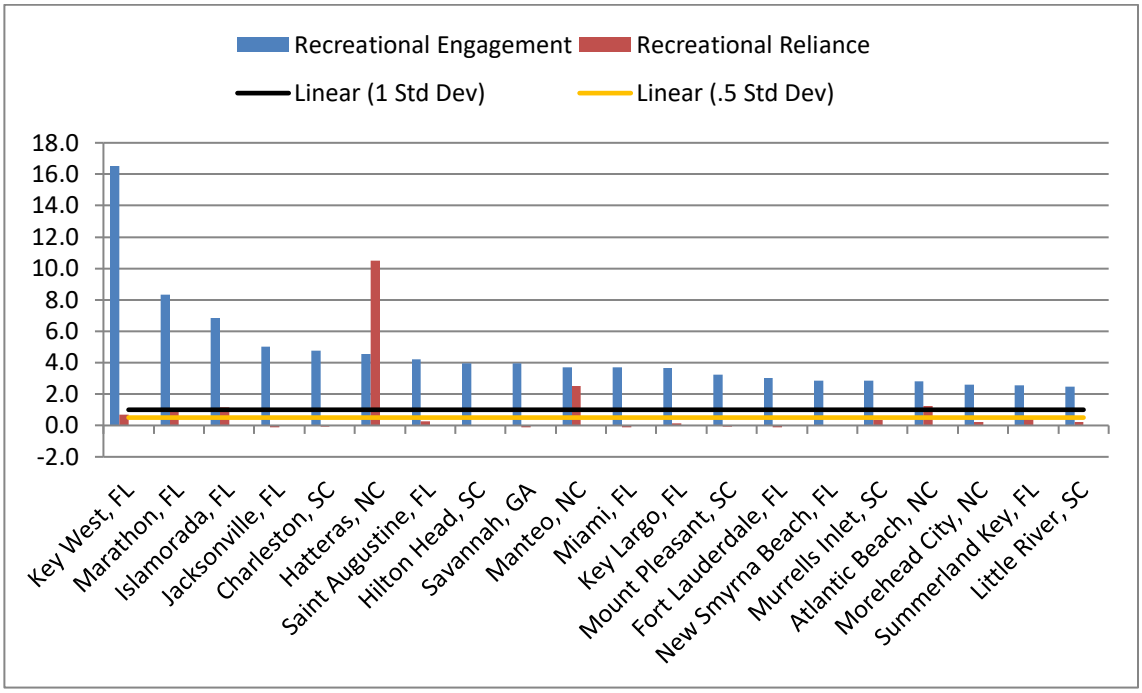

Figure 3.4.8. Recreational fishing communities' engagement and reliance.
Source: SERO, Community Social Vulnerability Indicators Database 2017 (American Community Survey 2010-2014).

Charter Vessels and Headboats by Community

Federal for-hire permits for South Atlantic snapper grouper are held by those with mailing addresses in a total of 438 communities, located in 26 states (SERO permit office, December 27, 2017). **Figure 3.4.9** provides the geographical distribution of federal for-hire permits by community. The figure focuses on the eastern US because the majority of permits are issued to individuals with addresses in the South Atlantic, Gulf, and Mid-Atlantic regions. A small number of permits are held by individuals with addresses in the western US, which is not shown. The communities with the most for-hire permits for snapper grouper are provided in **Table 3.4.2**. The majority of top communities are located in Florida, followed by North Carolina, South Carolina, and Georgia.

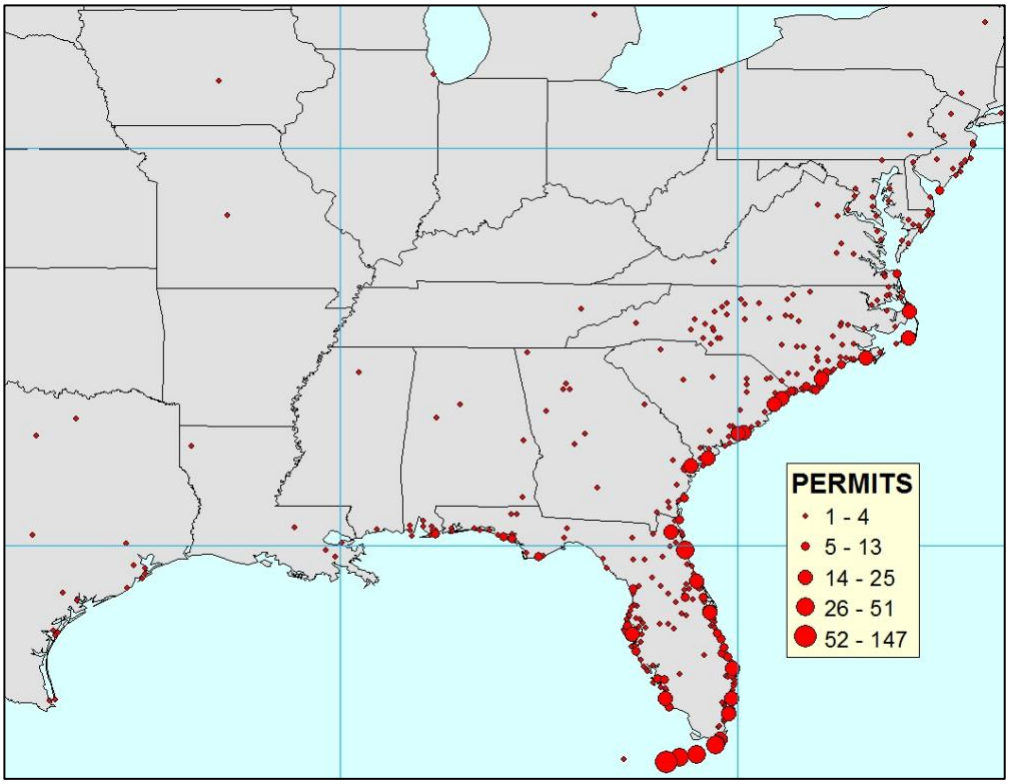

Figure 3.4.9. Number of federal for-hire permits for South Atlantic snapper grouper by community. Source: NMFS SERO permit office, December 27, 2017.

Table 3.4.2. Top ranking communities based on the number of federal for-hire permits for South Atlantic snapper grouper, in descending order**.**

State	Community	Permits
FL	Key West	147
FL	Marathon	51
FL	St. Augustine	34
FL	Islamorada	31
FL	Summerland Key	29
FL	Merritt Island	25
FL	Tavernier	24
NC	Hatteras	24
FL	Naples	22
NC	Wilmington	22
FL	Port Orange	21
NC	Manteo	21
SC	Hilton Head	21
FL	Jacksonville	20
SC	Murrells Inlet	20

FL	Fort Lauderdale	19
GA	Savannah	19
SC	Charleston	19
FL	St. Petersburg	18

Source: NMFS SERO permit office, December 27, 2017.

Charter vessels and headboats target red grouper species throughout the South Atlantic. At this time it is not possible to determine which species are targeted by specific charter vessels and associate those vessels with their homeport communities. However, harvest data are available for headboats by species and can be linked to specific communities through the homeport identified for each vessel. These data are available for headboats registered in the SRHS. The SRHS includes a subset of vessels with federal for-hire permits.

In 2016, 75 federal for-hire vessels in the South Atlantic were registered in the SRHS (SRHS, SERO Limited Access Privilege Programs/Data Management database). The top communities by headboat landings of red grouper are provided in **Table 3.4.3**. Top communities are located in Florida, North Carolina, and South Carolina.

Table 3.4.3. Top homeports based on number of red grouper landed by headboats included in the SRHS.

Homeport Ranked
Stock Island, FL
Islamorada, FL
Key West, FL
Marathon, FL
Fort Lauderdale, FL
Key Largo, FL
Morehead City, NC
Boynton Beach, FL
Lantana, FL
Atlantic Beach, FL
Stuart, FL,
Lake Worth, FL
Riviera Beach
North Miami Beach, FL
Carolina Beach, NC
Little River, SC
Cape Canaveral, FL
Hollywood, FL
Jupiter, FL
Ponce Inlet, FL
Wrightsville Beach, NC

Source: SRHS, SERO Limited Access Privilege Programs/Data Management Database, 2016.

Environmental Justice

Executive Order 12898 requires federal agencies conduct their programs, policies, and activities in a manner to ensure individuals or populations are not excluded from participation in, or denied the benefits of, or subjected to discrimination because of their race, color, or national origin. In addition, and specifically with respect to subsistence consumption of fish and wildlife, federal agencies are required to collect, maintain, and analyze information on the consumption patterns of populations who principally rely on fish and/or wildlife for subsistence. The main focus of Executive Order 12898 is to consider "the disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories…" This executive order is generally referred to as environmental justice (EJ).

Recreational fishermen, their households, and associated industries could be impacted by the proposed actions. However, information on the race and income status for groups at the different participation levels is not available. Although information is available concerning communities overall status with regard to minorities and poverty (e.g., census data), such information is not available specific to fishermen, their households, and those involved in the industries and activities, themselves. To help assess whether any environmental justice concerns arise from the actions in this regulatory amendment, a suite of indices were created to examine the social vulnerability of coastal communities. The three indices are poverty, population composition, and personal disruptions. The variables included in each of these indices have been identified through the literature as being important components that contribute to a community's vulnerability. Indicators such as increased poverty rates for different groups, more single female-headed households and households with children under the age of five, disruptions such as higher separation rates, higher crime rates, and unemployment all are signs of populations experiencing vulnerabilities. Again, for those communities that exceed the threshold it would be expected that they would exhibit vulnerabilities to sudden changes or social disruption that might accrue from regulatory change.

Figure 3.4.3 provides the social vulnerability for some of the top recreational communities (**Figure 3.4.9**), top ranking communities based on the number of federal for-hire permits for South Atlantic snapper grouper (**Table 3.4.2**), and top South Atlantic communities with headboats included in the SRHS and with landings of red grouper (**Table 3.4.3**). Several South Atlantic communities exceed the threshold of 0.5 standard deviation for at least one of the social vulnerability indices: Marathon, St. Augustine, Miami, Ft. Lauderdale, Stock Island, and Lantana, Florida; Manteo, Morehead City, Wilmington, and Calabash, North Carolina; and Savannah, Georgia. The communities of Miami, Florida and Savannah, Georgia exceed the threshold for all three social vulnerability indices. These communities have substantial vulnerabilities and may be susceptible to further effects from any regulatory changes depending upon the direction and extent of that change.

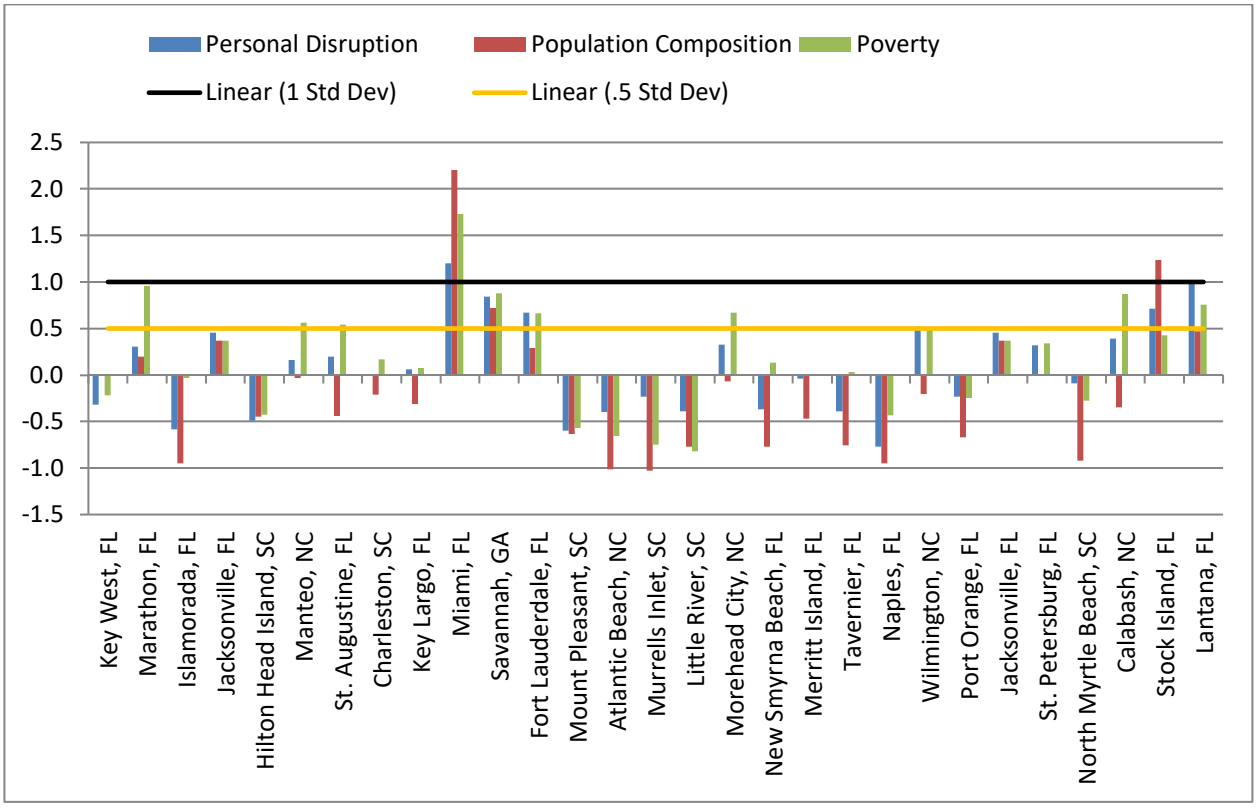

Figure 3.4.3. Social vulnerability indices for top recreational communities.
Source: SERO, Community Social Vulnerability Indicators Database 2017 (American Community Survey 2010-2014).

People in these communities may be affected by fishing regulations in two ways: participation (including targeting, catching, and/or consuming the fish) and employment. Although these communities may have the greatest potential for EJ concerns, no data are available on the race and income status for those involved in the local fishing industry (employment), or for their dependence on specific snapper grouper species (participation). However, the implementation of the proposed actions of this regulatory amendment would not discriminate against any group based on their race, ethnicity, or income status because the proposed actions would be applied to all participants in the fishery, although there may be income and/or race or other demographic differences between the average private angler and the average owner of a for-hire fishing business with a federal permit. Thus, the actions of this regulatory amendment are not expected to result in adverse or disproportionate environmental or public health impacts to EJ populations. Although no EJ issues have been identified, the absence of potential EJ concerns cannot be assumed.

3.5 Administrative Environment

3.5.1 The Fishery Management Process and Applicable Laws

3.5.1.1 Federal Fishery Management

Federal fishery management is conducted under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (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. The South Atlantic Council also established two voting seats for the Mid-Atlantic Council on the South Atlantic Mackerel Committee. 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 and legal 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.

3.5.1.2 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 Environmental Quality. 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 Atlantic States Marine Fisheries Commission (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's 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.

3.5.1.3 Enforcement

Both the NMFS 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 Schedule is available online at http://www.gc.noaa.gov/enforce-office3.html.

Chapter 4. Environmental Consequences and Comparison of Alternatives

4.1 Action 1 – Revise the Rebuilding Schedule for Red Grouper.

4.1.1 Biological and Ecological Effects

Alternatives*

1 No Action. The current rebuilding schedule is set at the maximum time period allowed to rebuild (T_{max}). This is equal to 10 years with the rebuilding time period ending in 2020. 2011 was Year 1.

2. Revise the rebuilding schedule to equal the shortest possible time period to rebuild in the absence of fishing mortality (T_{Min}). This would equal 6 years with the rebuilding time period ending in 2023. 2018 would be Year 1.

3. Revise the rebuilding schedule to equal 8 years with the rebuilding time period ending in 2025. 2018 would be Year 1.

4. Revise the rebuilding schedule to equal the maximum time period allowed to rebuild (T_{Max}). This would equal 10 years with the rebuilding time period ending in 2027. 2018 would be Year 1.

* Preferred indicated in bold. Refer to Chapter 2 for detailed language of alternatives.

None of the proposed alternatives to revise the rebuilding schedule have direct biological effects on the red grouper stock. There are regulations currently in place (i.e., ACLs and accountability measures (AMs)) to control the level of harvest and the proposed action is not expected to alter the manner in which the red grouper resource is exploited. An update to the SEDAR 53 (2017) assessment (or a standard stock assessment based on the availability of new information) is expected to be completed within the next 3-5 years and fishing levels for red grouper could be adjusted at that time. **Alternative 1 (No Action)** is not a viable alternative as the results of the latest stock assessment indicated that the stock is overfished and would not rebuild by 2020 under the current rebuilding schedule, and there are statutory requirements to rebuild a stock that is overfished. Out of the viable alternatives, a rebuilding schedule under **Alternative 2** would rebuild the red grouper stock in the least amount of time.

However, the probability of success of rebuilding the stock would be highest under the longest time period to rebuild (**Alternative 4**), followed by **Alternative 3,** and **Alternative 2**, with the shortest amount of time period to rebuild the stock. In general, less time to rebuild could result in lower ACLs and more restrictive management measures in the future, but would translate into higher biological benefits for the stock hence, biological effects would be higher under **Alternative 2**, followed by **Alternatives 3** and **4**. Compared to **Alternative 1 (No Action)**, the biological effects of **Alternatives 2-4** would be beneficial since management would be responding to the best scientific information available and results of the SEDAR 53 stock assessment have indicated that the stock of red grouper is overfished.

Alternative 1 (No Action) would incur the highest adverse biological effects since the stock would not rebuild in the current time period, and is therefore not a viable alternative to consider. **Alternative 2** would provide the second shortest rebuilding time period of 6 years, and it can be expected that biological benefits may accrue soonest, but would have the lowest probability of success. **Alternative 3** would

rebuid a few years later at 8 years, and **Alternative 4** would provide the longest rebuilding period of 10 years and also have the highest probablility of success, but biological benefits would accrue the slowest.

Expected Effects to Habitat and Protected Species

The alternatives under this action would not significantly modify the way in which the snapper grouper fishery is prosecuted in terms of gear types. Therefore, there are no additional impacts on ESA-listed species or designated critical habitats anticipated as a result of this action (see **Section 3.2.5** for a detailed description of ESA-listed species and critical habitat in the action area). Furthermore, no additional impacts on EFH or EFH-HAPCs are expected to result from any of the alternatives considered for this action (see **Section 3.1.3** and **Appendix H** for detailed descriptions of EFH in the South Atlantic region).

4.1.2 Economic Effects

A rebuilding schedule does not impose direct economic effects, as it does not directly constrain harvest or fishing effort. There can be indirect economic effects that occur due to a rebuilding schedule, as the length of the rebuilding period selected can determine how stringent management measures should be; with shorter rebuilding periods requiring more stringent management measures that may create negative short-term economic effects for a fishery. In the long-term a shorter rebuilding period may allow the benefits of a rebuilt stock to be incurred more quickly. Conversely, longer rebuilding periods would require less stringent short-term management measures, but long-term benefits may accrue later.

Alternative 1 (No Action) would incur the highest implied short-term economic effects, but is unrealistic as the red grouper stock is will not rebuild by 2020 under the current rebuilding schedule, regardless of the management changes made for the fishery. Additionally, it is not a viable alternative to consider, as the most recent stock assessment determined red grouper to be overfished and that the stock will not meet its current rebuilding target of 2020. There are also statutory requirements in place that require the rebuilding schedule to be revised to reflect the new timeline for rebuilding of the red grouper stock. **Alternative 2** would provide the second shortest rebuilding period of 6 years and likely the second highest implied short-term economic effects over the rebuilding timeframe. **Alternative 4** would provide the longest rebuilding period of 10 years and hence possibly the lowest implied short-term economic effects over the rebuilding timeframe. The restrictiveness of management measures for **Alternative 3** (8 years) falls between that of **Alternatives 2** and **4**.

Presumably the degree of short-term adverse economic consequences would vary with the restrictiveness of management measures implied under the various alternatives. It can be expected that future benefits may accrue soonest under **Action 1 (No Action)**, followed by **Alternative 2, Alternative 3** and **Alternative 4**. In terms of fewest implied short-term negative economic effects, **Alternative 4** would have the fewest negative economic effects followed by **Alternative 3**, **Alternative 2**, and **Alternative 1 (No Action)**.

4.1.3 Social Effects

Although defining a rebuilding schedule is an administrative action, the schedule will determine the severity of the management measures necessary to rebuild the red grouper resource within the allotted timeframe. The severity of these measures will determine the magnitude of the associated social effects that are expected to accrue during the rebuilding period. Generally, the shorter the rebuilding schedule,

the more severe the harvest restrictions. The more severe the harvest restrictions, the greater the short-term negative effects on fishing communities. Commercial and recreational fishermen may be able to adjust to the restrictions by switching to other species and/or seeking other employment or recreational pursuits, thereby mitigating any potential negative social effects. However, if other species are also depleted, regulations may prevent switching to another fishery and net negative social effects are potentially more severe. If current resource users choose or are economically forced to exit the fishery due to measures implemented to achieve rebuilding, long-term benefits associated with recovery may be realized by a different set of users.

Because the current red grouper rebuilding plan is not making adequate process, the current rebuilding schedule must be revised, as proposed in **Alternative 1 (No Action)** through **Alternative 4**. Therefore, **Alternative 1 (No Action)**, which would not revise the rebuilding schedule, would require subsequent additional management action to adopt a legally compliant rebuilding schedule. Overall, if the rebuilding schedule and subsequent management measures ensure the sustainability of the red grouper resource, as envisioned, there would be long-term positive social effects throughout the fishery in the form of consistent access to the resource.

4.1.4 Administrative Effects

In general, the shorter the rebuilding schedule, the more restrictive the harvest limitations will be needed to rebuild the stock within the specified timeframe. Greater restrictions can result in increased impacts on the administrative environment due to an increased need to closely track landings; enforce bag, trip, and size limits; or implement in-season and post-season AMs. **Alternative 1 (No Action)** would not revise the rebuilding schedule for the red grouper stock and would, therefore, not comply with Magnuson-Stevens Act requirements for implementing rebuilding plans within two years' notification of an overfish stock status. **Alternative 2** would rebuild the red grouper in the least amount of time (six years) and has the highest likelihood of translating into lower ACLs and more stringent management measures in the future.. **Alternative 3** would rebuild the stock in eight years, and **Alternatives 4** would have the longest rebuilding schedule considered (10 years). Therefore, of all the rebuilding schedule alternatives that specify a timeframe, **Alternatives 1 (No Action)** and **2,** followed by **Alternatives 3** and **4,** would be most likely to impact the administrative environment in the form of developing, implementing, and monitoring more restrictive harvest regulations for red grouper.

4.2 Action 2 - Modify the seasonal prohibition on recreational harvest and possession of red grouper in the Exclusive Economic Zone off South Carolina and North Carolina.

4.2.1 Biological and Ecological Effects

Alternatives*

1. No Action. During January through April, no person may fish for, harvest, or possess in or from the South Atlantic exclusive economic zone any shallow-water grouper (gag, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, graysby, or coney).

2. During January through April, no person may fish for, harvest, or possess in or from the South Atlantic exclusive economic zone any shallow-water grouper (gag, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, graysby, or coney). Revise the timing of these restrictions only for red grouper in the exclusive economic zone off North Carolina and South Carolina as follows:

Preferred Sub-alternative 2a. January – May (five months)
Sub-alternative 2b. February – May (four months)
Sub-alternative 2c. March – June (four months)

* Preferred indicated in bold. Refer to Chapter 2 for detailed language of alternatives.

Red grouper spawn from February through June in the South Atlantic with a peak in April (**Table 3.2.1, Burgos 2001**). **Alternative 1 (No Action)** would retain the January 1 through April 30 spawning season closure for shallow-water groupers, including red grouper, for the recreational sector in the South Atlantic EEZ thus continuing to impart biological benefits to these shallow-water species. However, better aligning the prohibition on harvest and possession with when red grouper are spawning is expected to result in beneficial biological effects to the stock. Fishermen have indicated that red grouper harvested in May off North Carolina are frequently in spawning condition and there is concern that the current spawning season closure is not capturing the bulk of spawning activity for that species off North Carolina (SAFMC, port meetings 2014). therefore, **Alternative 2** (and **Sub-alternatives 2a (Preferred)-2c)** would result in greater biological benefits over **Alternative 1 (No Action)** since the spawning season closure would be extended past April when red grouper are still determined to be in spawning condition. While none of the proposed sub-alternatives encompasses the entirety of the red grouper spawning period in the South Atlantic, a longer time period during which harvest and possession of this species is prohibited would be beneficial. Hence, **Preferred Sub-alternative 2a** would result in greater biological benefits since the spawning closure would capture five months of spawning activity, followed by **Sub-alternatives 2b and 2c**, which would cover the beginning month of spawning activity, and the last month of spawning activity, respectively.

Since 2012, recreational landings have been well below the recreational ACL, and have shown a declining trend in recent years (**Table 3.2.2**). Abbreviated Framework 1, effective August 27, 2018, (83 FR 35437; July 26, 2018) revised the total, recreational, and commercial ACLs for red grouper, for 2018 and later years (**Table 3.2.4**). However, recreational landings from 2015 through 2017 have exceeded the newly implemented recreational ACL (had those values been in place) (SAFMC 2017) **(Table 4.2.1.1** and **Table 4.2.1.2**). During these years, the highest recreational landings for red grouper have occurred in November and December followed by May and June (**Figure 4.2.1.1**), and the lowest landings occurred from January through April.

Table 4.2.1.1. Recreational red grouper landings in the South Atlantic Region, 2015 to 2017.

Year	Recreational ACL (lbs ww)	Recreational Red Grouper Landings (lbs ww)	% ACL Landed
2015	436,800	96,430	33
2016	436,800	155,271	36
2017	436,800	128,213	29

Source: NMFS SERO ACL.

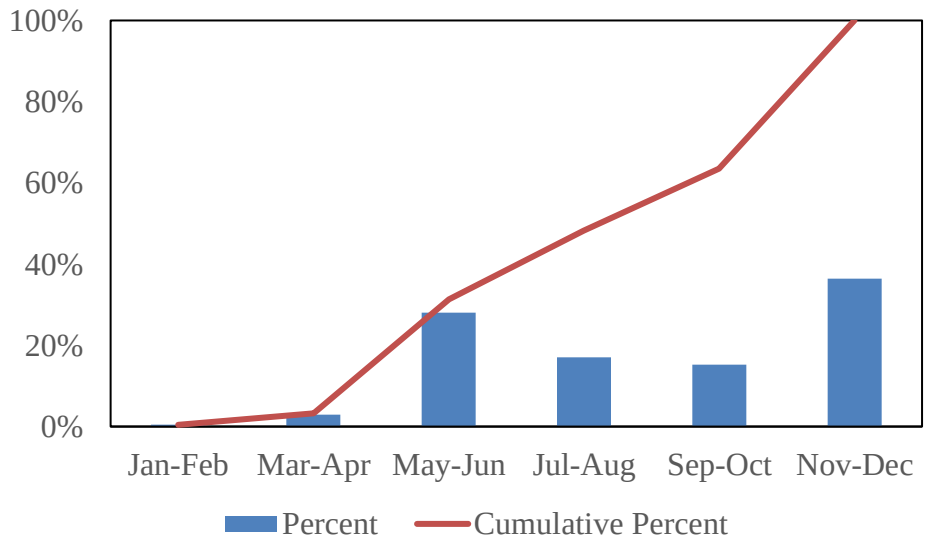

Figure 4.2.1.1. Percent and cumulative percent of red grouper landings by wave for the South Atlantic recreational sector (charter boat, headboat, and private vessels) from 2015 to 2017.

Table 4.2.1.2. Recreational red grouper annual catch limit (ACL) in pounds whole weight (lbs ww) recently implemented through Abbreviated Framework 1 to the Snapper Grouper FMP.

Year	Recreational ACL (lbs ww)
2018	77,840
2019	84,000
2020 until modified	90,720

Refer to **Appendix H** for detailed methodology and assumptions used landings in analyses for this action. Projected South Atlantic red grouper recreational landings were estimated from the average 2015-2017 commercial landings under each of Action 2 alternatives (**Table 4.2.1.3**). **Figure 4.2.1.2** presents projected cumulative recreational red grouper landings (lbs ww) under the proposed alternatives and sub-alternatives and the recreational red grouper ACLs implemented through Abbreviated Framework 1.

All of the alternatives in this framework amendment are not expected to constrain harvest to the recreational ACL, resulting in in-season closures (**Figure 4.2.1.3**). However, while **Alternative 1 (No Action)** currently encompasses the bulk of red grouper spawning activity, alternatives that extend protection past April, the month of peak spawning in the region, and also reduce harvest where mortality from fishing is zero (F=0), would impart biological benefits to the stock. Hence, **Sub-alternatives 2a (Preferred)-2c** would result in positive biological effects for red grouper off North Carolina and South Carolina since these alternatives encompass the peak spawning month (April) and would extend the closure through May (**Preferred Sub-alternative 2a** and **2b**), and June (**Sub-alternative 2c**).

Table 4.2.1.3. Projected recreational red grouper landings (pounds whole weight, lbs ww) that would have occurred 2015 -2017 under the proposed alternatives and sub-alternatives by modifying the recreational seasonal prohibition for red grouper.

Alternatives	Projected Landings (lbs ww)
Alternative 1 (No Action)	181,206
Sub-Alternative 2a (Jan-May)	**180,913**
Sub-Alternative 2b (Feb-May)	180,913
Sub Alternative 2c (Mar-Jun)	180,620

Source:

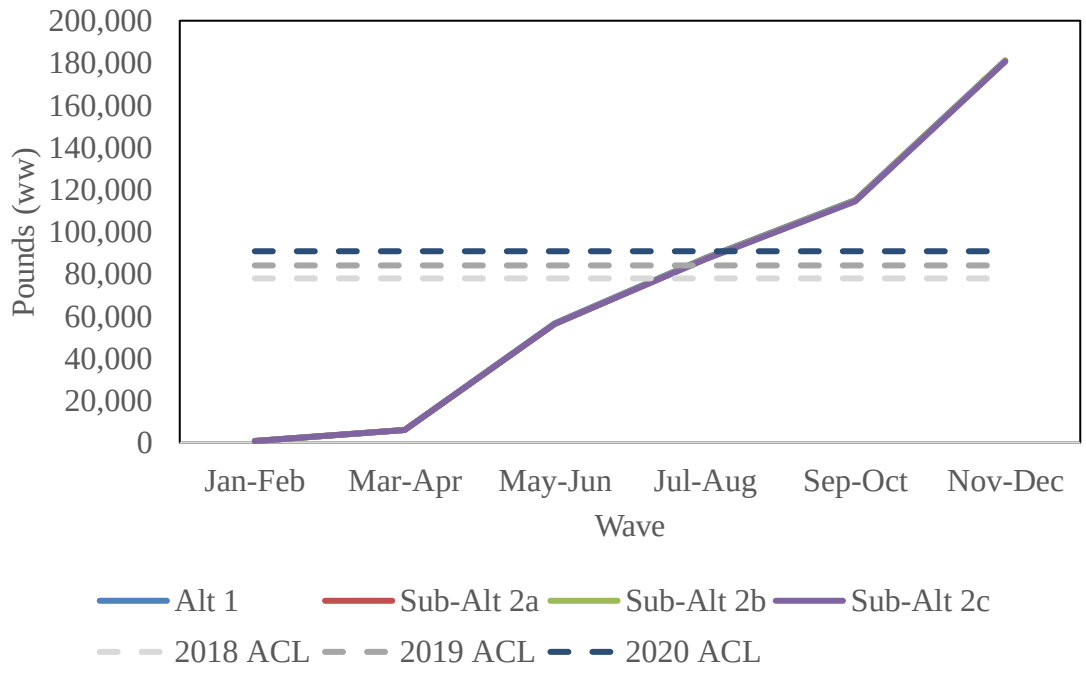

Figure 4.2.1.2. Projected cumulative recreational red grouper landings (pounds whole weight (lbs ww) under the proposed alternatives and sub-alternatives and the proposed recreational red grouper ACL from 2018, 2019, and 2020 and beyond.

Source:

Expected Effects to Habitat and Protected Species

The alternatives under this action would not significantly modify the way in which the snapper grouper fishery is prosecuted in terms of gear types. Therefore, there are no additional impacts on ESA-listed species or designated critical habitats anticipated as a result of this action (see **Section 3.2.5** for a

detailed description of ESA-listed species and critical habitat in the action area). Furthermore, no additional impacts on EFH or EFH-HAPCs are expected to result from any of the alternatives considered for this action (see **Section 3.1.3** and **Appendix H** for detailed descriptions of EFH in the South Atlantic region).

4.2.2 Economic Effects

In general, providing increased protection for spawning aggregations of red grouper that results in improvements in stock abundance and biomass would create indirect, long-term, positive economic effects presumably through the availability of increased numbers of fish in the future. However, there can be some direct, short-term negative economic effects as fewer fish would be available to harvest until the current population grows to the point where the biomass of harvestable fish increases.

Alternative 1 (No Action) will maintain the current January through April prohibition of shallow-water groupers harvested recreationally from or possessed in the South Atlantic EEZ, including red grouper. **Preferred Alternative 2** would modify the duration of the prohibition, specifically for red grouper, off of North Carolina and South Carolina. Increasing the duration of the red grouper prohibition or shifting the dates of the prohibition off of the Carolinas (**Preferred Sub-alternative 2a** and **Sub-alternatives 2b** and **2c**) would be expected to reduce landings of red grouper and, consequently, consumer surplus (CS) as well (**Section 4.2.1**). In relation to overall harvest, the projected marginal decrease from modifying the seasonal prohibition on recreational possession of red grouper in the EEZ off of South Carolina and North Carolina is less than 1% of the catch, signaling a likely minimal impact on CS in the recreational sector (**Section 4.2.1**). While the overall economic effects are expected to be minor, some CS may be lost on trips when red grouper are caught but must be discarded due to changes in the annual prohibition in **Sub-alternatives 2a** through **2c**. To estimate the change in total CS, the average landings of red grouper from 2015-2017 as well as the projected reductions in landings found in **Table 4.2.1.3** were converted to numbers of fish using a conversion rate of 7.301 pounds whole weight (ww) per fish which is the aveage observed weight of recreationally landed red grouper in the South Atlantic Region[4]. The change in landings were paired with a marginal CS value of $105.14 per fish (2017 dollars)(**Section 3.3.2.3**). The resulting estimated change in CS that would occur under **Sub-alternatives 2a** through **2c** ranges from approximately -$4,200 to -$8,400 (2017 dollars)(**Table 4.2.2.1**), with the anticipated short-term decrease in CS from **Preferred Sub-alternative 2a** being approximately $4,200.

Table 4.2.2.1. Estimated change in consumer surplus for **Preferred Alternative 2** of **Action 2** in comparison to status quo (**Alternative 1**(**No Action**)) (2017 dollars). Preferred alternative is indicated in bold.

Sub-Alternative	Difference from baseline landings (numbers of fish)	Change in consumer surplus (2017 dollars)
Pref. Sub-Alt 2a	**-40**	**-$4,219**
Sub-Alt 2b	-40	-$4,219
Sub-Alt 2c	-80	-$8,439

[4] According to the Marine Recreational Information Program.

In addition to the described reductions in CS, there is the potential that angler demand for for-hire (charter and headboat) trips could decrease, creating the possibility of decreased booking rates and forhire business net operating revenue (NOR). Due to the complex nature of angler behavior and the for-hire industry, it is not possible to quantify these potential economic effects with available data[5]. As such, no estimates of the change in for-hire NOR are provided, although they may exist. The small change or marginal increase in the spawning season closure combined with relatively low catch rates of red grouper in the recreational sector and several other substitute grouper species being available, suggests that any short-term negative economic effects on the for-hire industry would be minimal.

Long-term indirect economic benefits in the form of potentially greater future harvest rates and corresponding consumer surplus would be expected to occur if the modified prohibition on red grouper off of North Carolina and South Carolina provides enhanced protection to spawning fish and biological benfits for the red grouper stock. **Alternative 1 (No Action)** is expected to have the lowest direct short-term negative economic effects, followed by equally by **Preferred Sub-alternative 2a** and **Sub-alternative 2b**, and then **Sub-alternative 2c**. When examining the long-term, positive economic effects that may occur due to the potential for improvements in the red grouper stock, the ranking would be inverse, with **Sub-alternative 2c** providing the highest potential positive economic effects, followed equally by **Preffered Sub-alternative 2a** and **Sub-alternative 2b**, and then **Alternative 1 (No Action)**.

4.2.3 Social Effects

The potential effects on recreational fishing and coastal communities of modifying the red grouper closure will be a trade-off between the biological benefits of the seasonal closure and resulting long-term social benefits from a heathier stock, and the increased recreational fishing opportunities if the closure is shortened. In general, a longer seasonal closure may be biologically beneficial to the stock and contribute to sustainable fishing opportunities in the future if the closure appropriately lines up with spawning, but a longer closure would be more likely to restrict access to red grouper. Each of the proposed sub-alternatives is projected to reduce recreational red grouper landings by less than 1% with **Sub-Alternative 2c** resulting in the largest reduction followed by **Preferred Sub-alternative 2a** and **Sub-alternative 2b** which are estimated to result in the same reduction (**Section 4.2.1**).

There may be some benefits to maintaining the current seasonal closure in **Alternative 1 (No Action)**, including minimized complexity in management that will result from North Carolina and South Carolina experiencing a different season prohibition time period under **Preferred Alternative 2**. However, public input from fishermen indicates that red grouper are still in spawning condition during May off the North Carolina coast. The biological benefits of the closure could be maximized if the closures were better tailored by area and better aligned with red grouper spawning periods. The benefits to recreational fishermen of more appropriate closures for the areas will be more likely under **Preferred Sub-alternative 2a, Sub-alternative 2b,** and **Sub-alternative 2c** than under **Alternative 1 (No Action).** Related, **Preferred Alternative 2** and its sub-alternatives have the positive social benefit of utilizing fishermen

[5] Anglers have heterogeneous preferences and may target and/or harvest a diverse mix of snapper grouper and other species on a trip. The absence of the opportunity to fish for any single species may or may not affect their overall desire to take/pay for trips.

knowledge to improve management measures which could have the social benefit of improving perceptions of the management process.

4.2.4. Administrative Effects

Modifying the recreational seasonal prohibition of red grouper under **Alternative 2** and its **sub-alternatives** so that the restrictions are inconsistent with other shallow-water grouper species and for different states could be confusing to the public and add to the administrative burden in order to inform and educate the public, compared to **Alternative 1 (No Action)**. Law enforcement would also need to be informed and educated, and modify their enforcement efforts based on the revised regulations. **Sub-Alternative 2a** may be less confusing to the public since one month would be added to the current seasonal prohibition, while **Sub-Alternative 2b** and **2c** would shift the four-month seasonal prohibition entirely, compared to the other shallow-water grouper species.

4.3 Action 3 - Modify the seasonal prohibition on commercial harvest, possession, sale, and purchase of red grouper in the Exclusive Economic Zone off South Carolina and North Carolina.

4.3.1 Biological and Ecological Effects

Alternatives*

1. No Action. During January through April, no person may fish for, harvest, or possess in or from the South Atlantic exclusive economic zone any shallow-water grouper (gag, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, graysby, or coney). Additionally, during January through April, no person may sell or purchase any shallow-water grouper harvested from or possessed in the South Atlantic exclusive economic zone.

2. During January through April, no person may fish for, harvest, or possess in or from the South Atlantic exclusive economic zone any shallow-water grouper (gag, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, graysby, or coney). Additionally, during January through April, no person may sell or purchase any shallow-water grouper harvested from or possessed in the South Atlantic exclusive economic zone. Revise the timing of these restrictions only for red grouper in the exclusive economic zone off North Carolina and South Carolina as follows:

Preferred Sub-alternative 2a. January – May (five months).
Sub-alternative 2b. February – May (four months)
Sub-alternative 2c. March – June (four months)

* Preferred indicated in bold. Refer to Chapter 2

Alternative 1 (No Action) would retain the January 1 through April 30 spawning season closure for shallow-water groupers, including red grouper, for the commercial sector in the South Atlantic EEZ thus continuing to impart biological benefits to these shallow-water species. However, better aligning the prohibition on harvest and possession with when red grouper are spawning is expected to result in beneficial biological effects to the stock; therefore, **Sub-alternatives 2a (Preferred)-2c** would result in biological benefits over **Alternative 1 (No Action)**. While none of the proposed sub-alternatives encompasses the entirety of the red grouper spawning period in the South Atlantic (February-June), a longer time period during which harvest and possession of this species is prohibited would be most beneficial. Hence, **Preferred Sub-alternative 2a** would result in greater biological benefits than **Sub-alternatives 2b** and **2c,** and **Alternative 1 (No Action).**

Since 2012, commercial landings have been well below their sector ACL (343,200 lbs ww in 2014-2018, 315,920 lbs ww in 2013, and 284,680 lbs ww in 2012). Total commercial red grouper landings in the South Atlantic from 2015 through 2017 are provided in **Table 4.3.1.1.** Confidentiality concerns prohibit the disclosure of a time series of red grouper landings considered in the action. The commercial ACLs implemented under Abbreviated Framework 1 are 61,160 lbs ww for 2018, 66,000 lbs ww for 2019, and 71,280 lbs ww for 2020 and later years (effective August 24, 2018). In recent years, commercial landings have declined each year, with 40,490 lbs ww being landed in 2017, which was well below the 2017 ACL, or any of the revised commercial ACLs implemented under Abbreviated Framework 1 **(Table 4.3.1.1**).

Table 4.3.1.1. Commercial red grouper landings in the South Atlantic Region, 2015 to 2017.

Year	Commercial ACL (lbs ww)	Commercial Red Grouper Landings (lbs ww)	% ACL Landed
2015	343,200	103,360	30.1
2016	343,200	52,290	15.2
2017	343,200	40,490	11.8

It is very challenging to make meaningful predictions of the amount of harvest that will be realized with the modification of the shallow-water grouper closure off North Carolina and South Carolina due to the duration it has been in place. Refer to **Appendix H** for detailed methodology and assumptions. Projected South Atlantic red grouper commercial landings were estimated from the average 2015-2017 commercial landings under each of Action 3 alternatives (**Table 4.3.1.2**). **Figure 4.3.1.1** presents South Atlantic red grouper commercial landings (lb ww) by month for 2015-2017, projected landings for all South Atlantic states, and projected landings for North Carolina and South Carolina for 2015-2017.

All Action 3 alternatives being considered in this regulatory amendment, including **Alternative 1 (No Action)** and **Preferred Sub-Alternative 2a**, would result in no seasonal closures, because projected landings (**Figure 4.3.1.2**) are below the ACLs implemented under Abbreviated Framework 1 **(Table 3.2.4**). While **Alternative 1 (No Action)** encompasses the bulk of red grouper spawning activity, alternatives that extend protection past April, the month of peak spawning in the region, would impart additional biological benefits to the stock. However, as discussed in **Section 4.2.1**, fishermen have indicated that red grouper harvested in May off North Carolina are frequently in spawning condition and there is concern that the current spawning season closure is not capturing the bulk of spawning activity for that species off North Carolina. Therefore, **Sub-alternatives 2a (Preferred)-2c** would result in positive biological effects for red grouper off the Carolinas, since they encompass the peak spawning month (April) and would extend the closure through May (**Preferred Sub-alternative 2a and 2b**), and though June (**Sub-alternative 2c**).

Table 4.3.1.2. Projected South Atlantic red grouper commercial landings for each **Action 3** alternatives. Landings were estimated from the average 2015-2017 commercial landings. Preferred alternative indicated in bold.

Action 3 Alternatives	Projected Landings (lbs ww)
Alternative 1 (No Action)	54,339
Sub-Alternative 2a	**46,404**
Sub-Alternative 2b	49,451
Sub-Alternative 2c	44,992

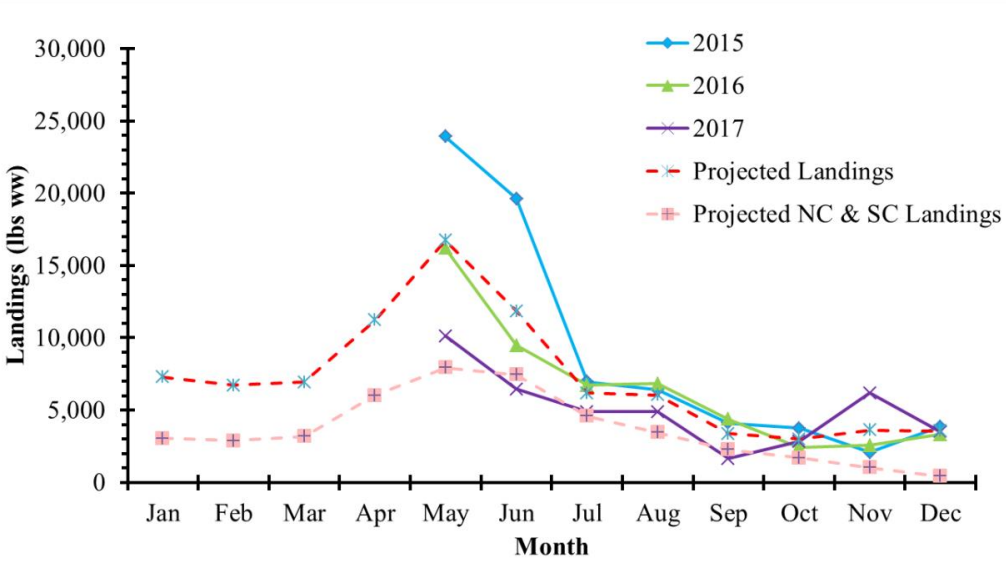

Figure 4.3.1.1. South Atlantic red grouper commercial landings (lb ww) by month for 2015-2017. Landings for the months of Jan-Apr were removed since these months are closed to all shallow-water grouper through Amendment 16 (SAFMC 2009) on July 29, 2009, and therefore future landings are assumed to be either zero or negligible. To produce Projected Landings (all states) and Projected NC and SC Landings for May through December, average landings from 2015-2017 are used. Projected January through April landings (for all states and North Carolina and South Carolina) were estimated using May landings, and the ratio was determined from historic landings from 2007-2009. No predictions were made for Florida and Georgia in January through April because none of the alternatives of Action 3 propose opening the red grouper fishery during this period in these states.

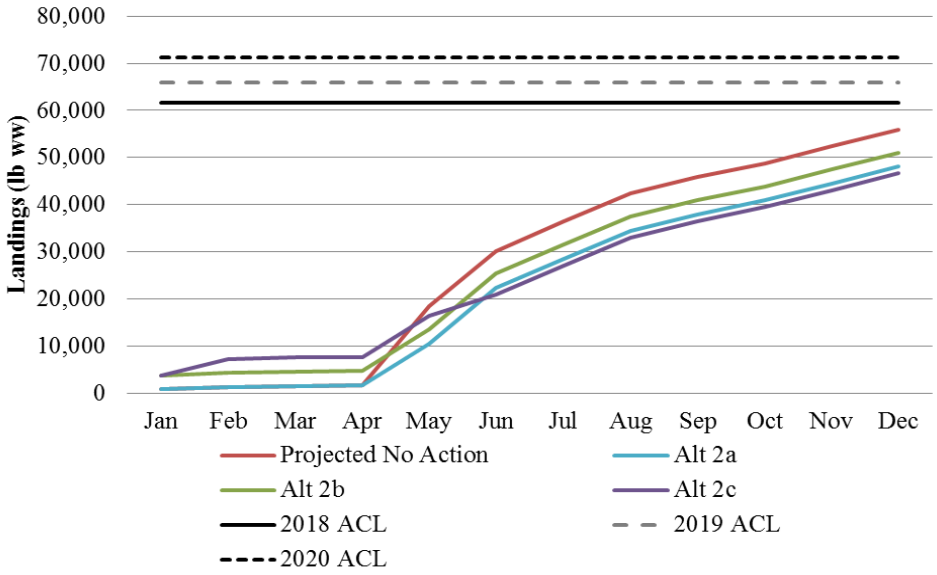

Figure 4.3.1.2. Predicted South Atlantic red grouper commercial landings (lbs ww) by month with the commercial ACLs stated in the Abbreviated Framework 1 to predict South Atlantic red grouper commercial closure dates.

Expected Effects to Habitat and Protected Species

The alternatives under this action would not significantly modify the way in which the snapper grouper fishery is prosecuted in terms of gear types. Therefore, there are no additional impacts on ESA-listed species or designated critical habitats anticipated as a result of this action (see **Section 3.2.5** for a detailed description of ESA-listed species and critical habitat in the action area). Furthermore, no additional impacts on EFH or EFH-HAPCs are expected to result from any of the alternatives considered for this action (see **Section 3.1.3** and **Appendix H** for detailed descriptions of EFH in the South Atlantic region).

4.3.2 Economic Effects

In general, providing increased protection for spawning aggregations of red grouper that results in improvements in stock abundance and biomass would create indirect, long-term, positive economic effects presumably through the availability of increased numbers of fish in the future. However, there can be some direct, short-term negative economic effects as fewer fish would be available to harvest until the current population grows to the point where the biomass of harvestable fish increases.

Alternative 1 (No Action) will maintain the current January through April prohibition on the sale or purchase of shallow-water groupers harvested from or possessed in the South Atlantic EEZ, including red grouper. **Preferred Alternative 2** would modify the duration of the prohibition, specifically for red grouper, off of North Carolina and South Carolina. Increasing the duration of the red grouper prohibition or shifting the dates of the prohibition off of the Carolinas (**Preferred Sub-alternative 2a** and **Sub-alternatives 2b** and **2c**) would be expected to reduce landings of red grouper and, consequently, ex-vessel revenue as well (**Section 4.3.1**). The estimated short-term change in landings and ex-vessel revenue that may occur under **Sub-alternatives 2a** through **2c** in comparison to **Alternative 1 (No Action)** is shown in **Table 4.3.2.1** and ranges from approximately -$18,600 to -$35,700 (2017 dollars). The anticipated short-term change in ex-vessel from **Preferred Alternative 2a** is approximately -$30,300.

Table 4.3.2.1. Estimated change in ex-vessel revenue for **Alternative 2** of **Action 3** in comparison to status quo (**Alternative 1**(**No Action**)) (2017 dollars). Preferred alternative is indicated in bold.

Sub-Alternative	Difference from baseline landings (lbs gw)	Change in ex-vessel (value)
Pref. Sub-Alt 2a	**-6,725**	**-$30,261**
Sub-Alt 2b	-4,142	-$18,641
Sub-Alt 2c	-7,921	-$35,645

In computing these values, commercial landings from 2015 through 2017 in pounds whole weight (lbs ww) provided in **Table 4.3.1.2** were converted to pounds gutted weight (lbs gw) using a conversion factor of 1.18 (SEDAR 53, 2016). After applying this conversion factor, the three-year average commercial red grouper landings of 47,439 lbs gw was considered the baseline in calculating the estimated marginal decrease in landings. Additionally, to calculate the ex-vessel value of the difference between the baseline landings and future ACLs, an ex-vessel price of $4.50 (2017 dollars) per pound (gw) was applied, which is the average ex-vessel price per pound (gw) of red grouper over the past three years of available data (2015-2017) (SEFSC-SSRG Socioeconomic Panel v.7 as accessed August 7, 2018). Inflation adjustments were made using the annual gross domestic product implicit price deflator provided by the U.S. Bureau of Economic Analysis.

In addition ot the reductions in ex-vessel value stated above, changes in the open season for red grouper may have varying effects on individual harvesters that fish off of North Carolina and South Carolina. These would depend on each harvester's profit maximization strategy, their dependence on red grouper, their seasonal fishing behavior, and their ability to adapt to the changing regulations. Unfortunately, these individual-level economic effects cannot be quantified with available data.

Long-term indirect economic benefits in the form of greater future harvest rates and corresponding ex-vessel revenue would be expected to occur if the modified prohibition on red grouper off of North Carolina and South Carolina provides enhanced protection to spawning fish and biological benfits for the red grouper stock. **Alternative 1 (No Action)** is expected to have the lowest direct negative economic effects, followed by **Sub-alternative 2b**, **Preferred Sub-alternative 2a**, and **Sub-alternative 2c**. When examining the long-term, positive economic effects that may occur due to the potential for improvements in the red grouper stock, the ranking would be inverse, with **Sub-Alternative 2c** providing the highest potential positive economic effects, followed by **Preffered Sub-alternative 2a**, **Sub-alternative 2b**, and **Alternative 1 (No Action)**.

4.3.3 Social Effects

The potential effects on commercial fishing businesses and coastal communities of modifying the red grouper closure will be a trade-off between the biological benefits of the seasonal closure and the increased commercial fishing opportunities if the closure is shortened. In general, a longer seasonal closure may be biologically beneficial to the stock and contribute to sustainable fishing opportunities in the future if the closure appropriately lines up with spawning, but a longer closure would be more likely to restrict access to red grouper. **Sub-alternative 2c** is projected to result in the largest decrease in landings followed by **Preferred Sub-alternative 2a**, and **Sub-alternative 2b** (**Section 4.3.1**).

There may be some benefits to maintaining the current seasonal closure in **Alternative 1 (No Action)**, including minimized complexity in management that will result from North Carolina and South Carolina experiencing a different time period during which commercial harvest restrictions would apply, as proposed under **Preferred Alternatives 2**. However, public input from fishermen indicates that red grouper are still in spawning condition during May off the North Carolina coast. The biological benefits of the closure could be maximized if the closures were better tailored by area and better aligned with red grouper spawning periods. The benefits to commercial fishermen of more appropriate closures for the areas will be more likely under **Preferred Sub-alternatives 2a**, **Sub-alternative 2b** and **2c** than under **Alternative 1 (No Action)**. Related, **Preferred Alternative 2** has the positive social benefit of utilizing fishermen knowledge to improve management measures which could have the social benefit of improving perceptions of the management process.

4.3.4. Administrative Effects

Modifying the commercial seasonal prohibition of red grouper under **Alternative 2** and its **sub-alternatives** so that the restrictions are inconsistent with the other shallow-water grouper species and for different states could be confusing to the public and add to the administrative burden in order to inform and educate the public, compared to **Alternative 1 (No Action)**. Law enforcement would also need to be informed and educated, and modify their enforcement efforts based on the revised regulations. **Preferred**

Sub-Alternative 2a may be less confusing to the public since one month would be added to the current seasonal prohibition, while **Sub-Alternative 2b** and **2c** would shift the four-month seasonal prohibition entirely, compared to the other shallow-water grouper species.

4.4 Action 4 - Establish a commercial trip limit for red grouper harvested in the South Atlantic Exclusive Economic Zone.

4.4.1 Biological and Ecological Effects

> ***Alternatives****
>
> 1. No Action. There is no commercial trip limit for red grouper harvested in the South Atlantic exclusive economic zone.
>
> 2. Establish a commercial trip limit for red grouper harvested in the South Atlantic exclusive economic zone:
>
> Sub-alternative 2a. 75 pounds gutted weight.
> Sub-alternative 2b. 100 pounds gutted weight.
> Sub-alternative 2c. 150 pounds gutted weight.
> Sub-alternative 2d. 200 pounds gutted weight.
>
> * Preferred indicated in bold. Refer to Chapter 2 for detailed language of alternatives.

Currently, there is no commercial trip limit for red grouper harvested in the South Atlantic EEZ. In general, trip limits do not result in biological effects, positive or negative, since overall harvest is limited by the ACL, and AMs are in place to ensure the ACL is not exceeded. Even without a trip limit, there have been no in-season commercial closures for red grouper since an ACL was implemented in 2012 (see **Table 3.2.1** in **Section 3.2.1**).

Between 2015 and 2017, a total of 2,447 commercial trips harvested at least one pound of red grouper, and 77% of those commercial trips landed 75 lb gw or less of red grouper **(Figure 4.4.1.1)**. Under **Alternative 2** and its **sub-alternatives**, the total South Atlantic landings of red grouper would be reduced between 11% and 37% (**Table 4.4.1.1)**. As a result, no in-season closures for commercial South Atlantic red grouper would occur for each of the five proposed commercial trip limit alternatives. Therefore, there are no expected differences in biological effects for **Alternative 2** and its **sub-alternatives,** relative to **Alternative 1 (No Action)**.

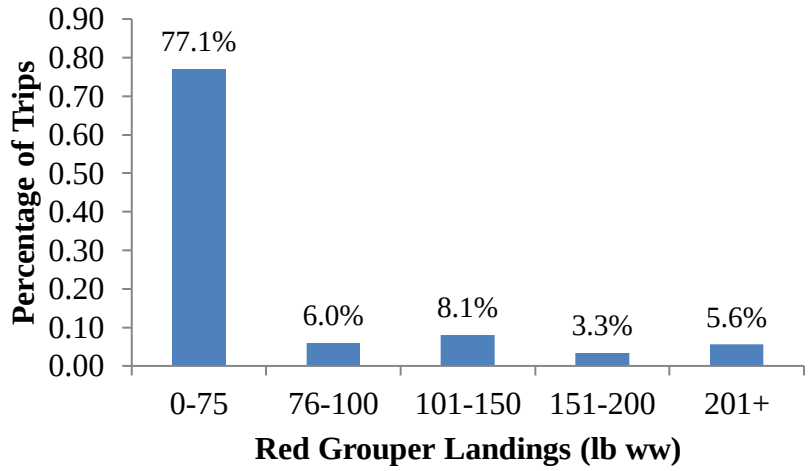

Figure 4.4.1.1. Distribution of South Atlantic red grouper commercial trips within each landing bin. Predicted commercial landings came from the average 2015-2017 commercial landings.

Table 4.4.1.1. Projected South Atlantic red grouper commercial landings for each Action 4 Alternatives. Landings were estimated from the average 2015-2017 commercial landings. Note: Alternatives do not assume Action 3 alternatives are included.

Action 4 Alternatives	Predicted Landings (lbs ww)	Percent Reduction from Alternative 1 (No Action)
Alternative 1 (No Action) (No Action 3 alternatives + No trip limit)	54,339	0%
Sub-Alternative 2a (No Action 3 alternatives + 75 lbs gw trip limit)	34,302	36.9%
Sub-Alternative 2b (No Action 3 alternatives + 100 lbs gw trip limit)	38,989	28.3%
Sub-Alternative 2c (No Action 3 alternatives + 150 lbs gw trip limit)	44,782	17.6%
Sub-Alternative 2d (No Action 3 alternatives + 200 lbs gw trip limit)	48,102	11.5%

Spawning activity for red grouper is from February through June in the South Atlantic with a peak in April (**Table 3.2.1**). Action 3 considers modifying the seasonal shallow-water grouper closure. If **Action 3 Preferred Sub-Alternative 2a** (Jan – Apr season prohibition in FL and GA and a Jan – May season prohibition in NC and SC) is implemented in conjunction with the **Action 4** trip limit alternatives, then the landings of South Atlantic commercial red grouper will be further reduced (**Table 4.4.1.2)**. Both actions together result in total landings that are further reduced to 46,404 lbs ww with no trip limit, and continue to decline with **Action 4 Sub-alternatives 2a-2d**. As a result, no in-season closures for commercial South Atlantic red grouper were projected for each of the five proposed commercial trip limit alternatives because none of the revised ACLs implemented through Abbreviated Framework 1 (beginning in 2018)were predicted to be met.

Table 4.4.1.2. Projected South Atlantic red grouper commercial landings combined with a January through May closed season for North Carolina and South Carolina (Action 3, preferred Sub-Alternative 2a) for each Action 4 Alternative. Landings were estimated from the average 2015-2017 commercial landings.

Action 4 Alternatives:	Predicted Landings (lbs ww)	Percent Reduction from Alternative 1 (No Action)
Alternative 1 (No Action) (Action 3 preferred + No trip limit)	46,404	0%
Sub-Alternative 2a (Action 3 preferred + 75 lbs gw trip limit)	29,491	36.4%
Sub-Alternative 2b (Action 3 preferred + 100 lbs gw trip limit)	33,461	27.9%
Sub-Alternative 2c (Action 3 preferred + 150 lbs gw trip limit)	38,341	17.4%
Sub-Alternative 2d (Action 3 preferred + 200 lbs gw trip limit)	41,099	11.4%

Expected Effects to Habitat and Protected Species

The alternatives under this action would not significantly modify the way in which the snapper grouper fishery is prosecuted in terms of gear types. Therefore, there are no additional impacts on ESA-listed species or designated critical habitats anticipated as a result of this action (see **Section 3.2.5** for a detailed description of ESA-listed species and critical habitat in the action area). Furthermore, no additional impacts on EFH or EFH-HAPCs are expected to result from any of the alternatives considered for this action (see **Section 3.1.3** and **Appendix H** for detailed descriptions of EFH in the South Atlantic region).

4.4.2 Economic Effects

Generally, trip limits are not considered to be economically efficient because they require an increase in the number of trips and associated trip costs to land the same amount of fish. However, the negative economic effects of this inefficiency can be offset by price support resulting from the supply limitations and the lengthening of seasons. Given the ACL for red grouper that restricts maximum harvest to sustainable levels, the alternative with the fewest number of trips that have to stop targeting red grouper because the trip limit has been reached would result in the least amount of direct negative economic effects, assuming the season does not close.

The sub-alternatives of **Alternative 2** set trip limits for red grouper. The lower the trip limit, the more likely some commercial vessels will experience direct negative economic effects. The majority of commercial trips landing red grouper record fewer than 75 lbs gw of the species, indicating that there will be no direct economic effects that occur from **Action 4** on many commercial trips that take place in the South Atlantic Region. Trip limits on red grouper may however reduce profitability for commercial vessels on some trips through a reduction in revenue and efficiency. Cumulatively, the estimated change in commercial landings for red grouper in realtion to **Alternative 1 (No Action)** are shown in **Table 4.4.2.1** in terms of weight and **Table 4.4.2.2** in terms of ex-vessel value. These calculations are based on the reductions specified in **Table 4.4.1.1** and **Table 4.4.1.2** in relation to the trip limits in **Sub-alternatives 2a** through **2d** on their own as well as the trip limits paired with the **Preferred Sub-alternative 2a** from **Action 3** that extends the spawning season closure for red grouper in the EEZ off of North and South Carolina. To provide the calculations in **Tables 4.4.2.1** and **4.4.2.2**, commercial landings in lbs ww were converted to lbs gw using a conversion factor of 1.18 (SEDAR 53, 2016) and an ex-vessel price of $4.50 (2017 dollars) per pound (gw) was applied, which is the average ex-vessel price per pound (gw) of red grouper over the past three years of available data (2015-2017) (SEFSC-SSRG Socioeconomic Panel v.7 as accessed August 7, 2018). The estimated change in ex-vessel revenue that may occur under **Sub-alternatives 2a** through **2d** ranges from approximately -$20,200 to -$76,400 (2017 dollars) (**Table 4.3.2.2**).

Table 4.4.2.1. Estimated change in commercial landings of red grouper (lbs gw) for **Action 4** in comparison to status quo (**Alternative 1**(**No Action**)) (numbers of fish).

Sub-Alternative	Trip Limit Without Change to the Spawning Season Closure ((Action 3, Alt. 1(No Action))	Trip Limit With Change to the Spawning Season Closure (Action 3, Pref. Sub-alt 2a)
Sub-alt 2a	-16,981	-14,333
Sub-alt 2b	-13,008	-10,969

Sub-alt 2c	-8,099	-6,833
Sub-alt 2d	-5,286	-4,496

Table 4.4.2.2. Estimated change in ex-vessel value for **Action 4** in comparison to status quo (**Alternative 1**(**No Action**)) (2017 dollars).

Sub-Alternative	Trip Limit Without Change to the Spawning Season Closure (Action 3, Alt. 1(No Action))	Trip Limit With Change to the Spawning Season Closure (Action 3, Pref. Sub-alt 2a)
Sub-alt 2a	-$76,412	-$64,499
Sub-alt 2b	-$58,538	-$49,359
Sub-alt 2c	-$36,446	-$30,749
Sub-alt 2d	-$23,785	-$20,231

4.4.3 Social Effects

Commercial fishermen in the communities identified in **Section 3.4** would likely be those affected by a change in the red grouper commercial trip limit. However, it is likely that fishermen who have targeted red grouper in recent years also target other species and would be able to adjust their businesses to adapt to regulatory changes. In general, a commercial trip limit may help slow the rate of harvest, lengthen a season, and prevent the ACL from being exceeded, but trip limits that are too low may make fishing trips inefficient and too costly if fishing grounds are too far away. Additionally, if the trip limit is too low, the commercial ACL may not be met.

Commercial landings of red grouper in the South Atlantic are low and the commercial ACL has not been met in recent years (**Table 3.2.2**). While a trip limit may help to slow the rate of harvest by restricting landings for larger vessels, it is likely that establishing a trip limit under **Alternative 2** would have minimal effects on commercial fishermen and associated communities. **Sub-alternative 2a** would result in the largest reduction in landings and **Sub-alternative 2d** would result in the lowest reduction in landings. When combined with **Action 3**/**Preferred Sub-alternative 2a** those reductions are estimated to be 36.4% and 11.4%, respectively (**Section 4.4.1**). However, none of the alternatives are anticipated to result in landings that would exceed the ACL and result in a shorter season. The absence of a trip limit under **Alternative 1 (No Action)** would likely have little effect on commercial fishermen in the short-term but could result in negative effects in the future if some commercial vessels began targeting red grouper at higher levels. Slowing the rate of harvest and contributing to rebuilding goals for red grouper would be expected to contribute to the sustainability of harvest and the health of the red grouper stock and provide for long-term social benefits.

4.4.4. Administrative Effects

Alternative 1 (No Action) would not change the administrative environment from its current state. Currently, there is a commercial quota monitoring system in place for red grouper that is utilized to monitor landings against the commercial quota. **Alternative 2** would establish a commercial trip limit for

red grouper, which may slow the rate that landings would reach the ACL, and lengthen the season should landings near the ACL.

Of the two alternatives (and sub-alternatives) considered for modifying the trip limit for red grouper, **Alternative 1 (No Action)** and **Alternative 2** (and its sub-alternatives) would impose similar administrative burdens. From 2012 through 2018, the ACL for red grouper has not been met prior to the end of the fishing year. When in combination with the modification of the red grouper seasonal prohibition restrictions proposed under **Actions 2** and **3,** and a trip limit implemented under **Alternative 2**, it is expected that the fishers will still not meet the ACL prior to the end of the fishing year, similarly to **Alternative 1 (No Action).** Therefore, if total effort for red grouper remains consistent, it is likely the theACL would not be reached prior to the end of the fishing year. Therefore, ongoing monitoring of the commercial quota would still be required, but fishery managers would likely not need to prepare and issue fishery closure notices, and enforcement personnel would not have to monitor the closures, but they would need to monitor the trip limits. As with all new management measures, education and outreach would be required under **Alternative 2** and **its sub-alternatives**.

Chapter 5. Council's Choice for the Preferred Alternatives

5.1 Action 1. Revise the Rebuilding Schedule for Red Grouper.

5.1.1 Snapper Grouper Advisory Panel (AP) Comments and Recommendations

5.1.2 Law Enforcement AP Comments and Recommendations

5.1.3 Scientific and Statistical Committee (SSC) Comments and Recommendations

5.1.4 Public Comments and Recommendations

5.1.5 South Atlantic Fishery Management Council (Council) Conclusions

5.1.6 How is this Action Addressing the Vision Blueprint for the Snapper Grouper Fishery?

1 No Action. The current rebuilding schedule is set at the maximum time period allowed to rebuild (T_{max}). This is equal to 10 years with the rebuilding time period ending in 2020. 2011 was Year 1.

2. Revise the rebuilding schedule to equal the shortest possible time period to rebuild in the absence of fishing mortality (T_{Min}). This would equal 6 years with the rebuilding time period ending in 2023. 2018 would be Year 1.

3. Revise the rebuilding schedule to equal 8 years with the rebuilding time period ending in 2025. 2018 would be Year 1.

4. Revise the rebuilding schedule to equal the maximum time period allowed to rebuild (T_{Max}). This would equal 10 years with the rebuilding time period ending in 2027. 2018 would be Year 1.

5.2 Action 2. Modify the seasonal prohibition on recreational harvest and possession of red grouper in the Exclusive Economic Zone off South Carolina and North Carolina.

5.2.1 Snapper Grouper AP Comments and Recommendations

5.2.2 Law Enforcement AP Comments and Recommendations

5.2.3 SSC Comments and Recommendations

5.2.4 Public Comments and Recommendations

5.2.5 Council Conclusions

5.2.6 How is this Action Addressing the Vision Blueprint for the Snapper Grouper Fishery?

1. No Action. During January through April, no person may fish for, harvest, or possess in or from the South Atlantic exclusive economic zone any shallow-water grouper (gag, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, graysby, or coney).

2. During January through April, no person may fish for, harvest, or possess in or from the South Atlantic exclusive economic zone any shallow-water grouper (gag, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, graysby, or coney). Off North Carolina and South Carolina, revise the timing of these restrictions only for red grouper as follows:

Preferred Sub-alternative 2a. January – May (five months)

Sub-alternative 2b. February – May (four months)

Sub-alternative 2c. March – June (four months)

5.3 Action 3. Modify the seasonal prohibition on commercial harvest, possession, sale, and purchase of red grouper in the Exclusive Economic Zone off South Carolina and North Carolina.

5.3.1 Snapper Grouper AP Comments and Recommendations

5.3.2 Law Enforcement AP Comments and Recommendations

5.3.3 SSC Comments and Recommendations

5.3.4 Public Comments and Recommendations

5.3.5 Council Conclusions

5.3.6 How is this Action Addressing the Vision Blueprint for the Snapper Grouper Fishery?

1. No Action. During January through April, no person may fish for, harvest, or possess in or from the South Atlantic exclusive economic zone any shallow-water grouper (gag, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, graysby, or coney). Additionally, during January through April, no person may sell or purchase any shallow-water grouper harvested from or possessed in the South Atlantic exclusive economic zone.

2. During January through April, no person may fish for, harvest, or possess in or from the South Atlantic exclusive economic zone any shallow-water grouper (gag, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, graysby, or coney). Additionally, during January through April, no person may sell or purchase any shallow-water grouper harvested from or possessed in the South Atlantic exclusive economic zone. Off North Carolina and South Carolina, revise the timing of these restrictions only for red grouper as follows:

Preferred Sub-alternative 2a. January – May (five months).

Sub-alternative 2b. February – May (four months)

Sub-alternative 2c. March – June (four months)

5.4 Action 4. Establish a commercial trip limit for red grouper harvested in the South Atlantic Exclusive Economic Zone.

1. No Action. There is no commercial trip limit for red grouper harvested in the South Atlantic exclusive economic zone.

2. Establish a commercial trip limit for red grouper harvested in the South Atlantic exclusive economic zone:
   Sub-alternative 2a. 75 pounds gutted weight.
   Sub-alternative 2b. 100 pounds gutted weight.
   Sub-alternative 2c. 150 pounds gutted weight.
   Sub-alternative 2d. 200 pounds gutted weight.

5.4.1 Snapper Grouper AP Comments and Recommendations

5.4.2 Law Enforcement AP Comments and Recommendations

5.4.3 SSC Comments and Recommendations

5.4.4 Public Comments and Recommendations

5.4.5 Council Conclusions

5.4.6 How is this Action Addressing the Vision Blueprint for the Snapper Grouper Fishery?

Chapter 6. Cumulative Effects

6.1 Affected Area

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 **Chapter 3**. For the actions found in Regulatory Amendment 30 (Regulatory Amendment 30) to the Fishery Management Plan (FMP) for the Snapper Grouper fishery of the South Atlantic Region (Snapper Grouper FMP), the cumulative effects analysis includes an analysis of data from 2014 through 2018.

6.2 Past, Present, and Reasonably Foreseeable Actions Impacting the Affected Area

For this action, the cumulative effects analysis (CEA) includes an analysis of actions and events dating back to 1983 when the original Fishery Management Plan (FMP) for the Snapper Grouper Fishery of the South Atlantic region (Snapper Grouper FMP) was implemented, and through what is expected to take place in the reasonably foreseeable future.

Fishery managers implemented the first significant regulations pertaining to snapper grouper species in 1983 through the Snapper Grouper FMP (Snapper Grouper FMP; SAFMC 1983). Listed below 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 and socio-economic environment. The complete history of management of the snapper grouper fishery can be found in **Appendix D (History of Management)**.

Past Actions

The Blueline Tilefish Emergency Rule to the Snapper Grouper FMP implemented temporary measures to reduce overfishing of blueline tilefish while permanent measures were being developed in Amendment 32. The temporary rule removed the blueline tilefish portion from the deep-water complex annual catch limits (ACL), and established separate commercial and recreational ACLs and accountability measures (AMs). The emergency rule published on April 17, 2014 (79 FR 21636). Those measures were extended through a temporary rule on October 14, 2014 (79 FR 61262, October 10, 2014), and were effective through April 18, 2015, while Amendment 32 and the associated rulemaking were being developed.

The Generic Dealer Reporting Amendment, which became effective on August 7, 2014, established one dealer permit for the Gulf of Mexico and South Atlantic regions and increased the reporting

frequency requirements for species managed by the South Atlantic Council and Gulf of Mexico Fishery Management Council. This amendment was expected to improve fisheries data collection, through more timely and accurate dealer reporting, and streamline the dealer permit system.

Regulatory Amendment 14 to the Snapper Grouper FMP, which became effective on December 8, 2014, in part, modified the commercial and recreational fishing year for greater amberjack, and modified the recreational AM for vermilion snapper.

Regulatory Amendment 21 to the Snapper Grouper FMP, which became effective on November 6, 2014, modified the definition of the overfished threshold for red snapper, blueline tilefish, gag, black grouper, yellowtail snapper, vermilion snapper, red porgy, and greater amberjack.

Amendment 32 to the Snapper Grouper FMP, which became effective on March 30, 2015, implemented meaures to end overfishing of blueline tilefish. The amendment removed blueline tilefish from the deepwater complex, specified AMs, recreational ACLs, and a commercial trip limit, and adjusted the recreational bag limit. The amendment also specified ACLs and revised the AMs for the recreational section of the deepwater complex (yellowedge grouper, silk snapper, misty grouper, queen snapper, sand tilefish, black snapper, and blackfin snapper).

Amendment 29 to the Snapper Grouper FMP, which became effective on July 1, 2015, updated the South Atlantic Council's acceptable biological catch (ABC) control rule to incorporate methodology for determining the ABC of "Only Reliable Catch Stocks," adjusted ABCs for the affected unassessed species, specified ACLs for 7 species based on the updated ABCs, and modified management measures for gray triggerfish.

Regulatory Amendment 20 to the Snapper Grouper FMP, which became effective on August 20, 2015, adjusted the recreational and commercial ACLs for snowy grouper, as well as adjusted the rebuilding strategy, modified the commercial trip limit and the recreational bag limit, and modified the recreational fishing season.

Amendment 33 to the Snapper Grouper FMP (also included with Amendment 7 to the FMP for the Dolphin and Wahoo Fishery of the Atlantic), which became effective on December 28, 2015, in part, was implemented to allow recreational fishermen to bring dolphin and wahoo fillets from The Commonwealth of The Bahamas (The Bahamas) into the U.S. exclusive economic zone (EEZ), and update regulations allowing recreational fishermen to bring snapper grouper fillets from the Bahamas into the U.S. EEZ.

Amendment 34 to the Snapper Grouper FMP (included in the Generic AM and Dolphin Allocation Amendment), in part, modified AMs for snapper grouper species to make them more consistent with AMs already implemented for other species and other FMPs. The regulations became effective on February 22, 2016.

Regulatory Amendment 25 to the Snapper Grouper FMP, in part, revised the commercial and recreational ACLs for blueline tilefish. The reguations for blueline tilefish became effective on July 13 2016.

Present Actions

The Vision Blueprint Recreational Regulatory Amendment 26 (Regulatory Amendment 26) for the Snapper Grouper FMP considers actions to establish arecreational deep-water aggregate, and specify the recreational season and bag limit for species in the deep-water aggregate.The regulatory amendment would also remove the recreational minimum size limit for deep-water species, modify the recreational minimum size limit for gray triggerfish off east Florida, and modify the bag limit for the 20-Fish aggregate.

Reasonably Foreseeable Future Actions

At the March 2018 meeting, the South Atlantic Council directed staff to continue to work on actions through Regulatory Amendment 29 to the Snapper Grouper FMP to address the use of best fishing practices and powerhead regulations in a framework amendment to expedite development (these actions were previously included in Amendment 46). The regulatory amendment was approved for scoping at the June 2018 meeting.

At the March 2018 meeting, the South Atlantic Council directed staff to conduct scoping webinars for Amendment 42 (Modifications to Sea Turtle Release Gear and Snapper Grouper Framework) to the Snapper Grouper FMP for proposed modifications to regulations for vessels with South Atlantic snapper grouper commercial or for-hire permits to allow the use of three additional sea turtle release gear types. The amendment also proposes changes to the snapper grouper framework procedure to facilitate modifying protected resources' release gear and handling requirements in the future. Scoping hearings were conducted in April 2018. South Atlantic Council staff delivered a summary of scoping comments and an overview of the decision document at the June 2018 meeting.

At the June 2018, meeting, the South Atlantic Council directed staff to begin development of an abbreviated framework (Abbreviated Framework Amendment 2) to define the ACLs for vermilion snapper and black sea bass based on the results of recent SEDAR stock assessments. Public hearings and final approval for Secretarial review are scheduled to be held at the September 2018 South Atlantic Council meeting.

At the June 2018 meeting, the South Atlantic Council reviewed Amendment 45 to the Snapper Grouper FMP (included in the Comprehensive ABC Control Rule Amendment) Options Paper and comments, and approved the document for scoping in late 2018. The amendment would modify the ABC control rule, specify an approach for determining the acceptable rish of overfishing and the probability of rebuilding success for overfished stocks, allow phase-in of ABC changes, and allow carry-over of unharvested catch.

Expected Impacts from Past, Present, and Future Actions

In recent years, participants in the snapper grouper commercial fishery and associated businesses have experienced some negative economic and social impacts due to changes in ACLs, and early closures during the fishing years. Factors such as distance to fishing grounds, and weather/temperature, affect

availability of some species to the commercial fleets in different parts of the South Atlantic Council's jurisdiction.

The proposed actions in Regulatory Amendment 30 are not expected to result in significant cumulative adverse biological or socio-economic effects (see **Chapter 4**). The proposed actions are intended to address commercial stakeholder input to enable equitable access for fishermen participating in the snapper grouper fishery, and to minimize discards. The actions are expected to improve management of the commercial sector of the snapper grouper fishery to order to achieve optimum yield, while minimizing, to the extent practicable, adverse socio-economic effects for commercial fishermen in the South Atlantic Region.

The proposed actions to consider split seasons for blueline tilefish, snowy grouper, greater amberjack, and red porgy, are intended to "line up" harvest for species that are often caught together to level out accessibility in different areas and to reduce regulatory discards, for the commercial sectors to snapper grouper species in the South Atlantic region. This may maximize efficiency on trips targeting multiple species and increase fishing opportunities, thus providing some economic relief for commercial fishermen who harvest snapper grouper species.

Modifying or specifying trip limits for blueline tilefish, greater amberjack, red porgy, vermilion snapper, and the Other Jacks Complex may help slow the rate of harvest, lengthen a season, and allow the commercial sector to better utilize ACLs. However, trip limits that are too low may make fishing trips inefficient and too costly if fishing grounds are too far away. Yet, a longer open season could be beneficial to the commercial fleet and to end users (restaurant owners, fish houses, and consumers) by improving consistency of availability. The likely cumulative socioeconomic effects would be improved commercial fishing opportunities, and benefits to associated businesses and communities.

Actions that remove size limits for deewater species are expected to reduce discard mortality. And actions that address almaco jack and gray triggerfish size limits were intented to respond to stakeholder's conerns over the small size and resulting poor commercial value of the fish being landed, and to stakeholders regarding increasing discards of gray triggerfish in south Florida where the average size of gray triggerfish is smaller than that in northeast Florida, respectively.

When combined with the impacts of past, present, and future actions affecting the snapper grouper fishery, specifically for the species in Regulatory Amendment 30, minor cumulative impacts are likely to accrue, such as monitoring ACLs for the commercial sector, and socio-economic benefits associated with improved management strategies.

6.3 Consideration of Climate Change and Other Non-Fishery Related Issues

Climate Change

Global climate changes could have significant effects on South Atlantic fisheries, though the extent of these effects on the snapper grouper fishery is not known at this time. The Environmental Protection Agency's climate change webpage (https://www.epa.gov/climate-indicators/marine-species-distribution),

and NOAA's Office of Science and Technology climate webpage (https://www.st.nmfs.noaa.gov/ecosystems/climate/index), provides background information on climate change, including indicators which measure or anticipate effects on oceans, weather and climate, ecosystems, health and society, and greenhouse gases. The United Nations Intergovernmental Panel on Climate Change's Fifth Assessment Report also provides a compilation of scientific information on climate change (November 2, 2014). Those findings are summarized below.

Ocean acidification, or a decrease in surface ocean pH due to absorption of anthropogenic carbon dioxide emissions, affects the chemistry and temperature of the water. Increased thermal stratification alters ocean circulation patterns, and causes a loss of sea ice, sea level rise, increased wave height and frequency, reduced upwelling, and changes in precipitation and wind patterns. Changes in coastal and marine ecosystems can influence organism metabolism and alter ecological processes such as productivity, species interactions, migration, range and distribution, larval and juvenile survival, prey availability, and susceptibility to predators. The "center of biomass," a geographical representation of each species' weight distribution, is being used to identify the shifting of fish populations. Warming sea temperature trends in the southeast have been documented, and animals must migrate to cooler waters, if possible, if water temperatures exceed survivable ranges (Needham et al. 2012). Harvesting and habitat changes also cause geographic population shifts. Changes in water temperatures may also affect the distribution of native and exotic species, allowing invasive species to establish communities in areas they may not have been able to survive previously. The combination of warmer water and expansion of salt marshes inland with sea-level rise may increase productivity of estuarine-dependent species in the short term. However, in the long term, this increased productivity may be temporary because of loss of fishery habitats due to wetland loss (Kennedy et al. 2002). The numerous changes to the marine ecosystem may cause an increased risk of disease in marina biota. An increase in the occurrence and intensity of toxic algae blooms will negatively influence the productivity of keystone animals, such as corals, and critical coastal ecosystems such as wetlands, estuaries, and coral reefs (Kennedy et al. 2002; IPCC 2014).

Climate change may 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. In the near term, it is unlikely that the management measures contained in Amendment 43 would compound or exacerbate the ongoing effects of climate change on snapper grouper species.

Weather Variables

Hurricane season is from June 1 to November 30, and accounts for 97% of all tropical activity affecting the Atlantic basin. These storms, although unpredictable in their annual occurrence, can devastate areas when they occur. Although these effects may be temporary, those fishing-related businesses whose profitability is marginal may go out of business if a hurricane strikes.

Deepwater-Horizon Oil Spill

On April 20, 2010, an explosion occurred on the Deepwater Horizon MC252 oil rig, resulting in the release of an estimated 4.9 million barrels of oil into the Gulf of Mexico (Gulf). In addition, 1.84 million gallons of Corexit 9500A dispersant were applied as part of the effort to constrain the spill. The cumulative effects from the oil spill and response may not be known for several years. The oil spill

affected more than one-third of the Gulf area from western Louisiana east to the panhandle of Florida and south to the Campeche Bank in Mexico. The impacts of the Deepwater Horizon MC252 oil spill on the physical environment are expected to be significant and may be long-term. Oil is dispersed on the surface, and because of the heavy use of dispersants, oil is also documented as being suspended within the water column, some even deeper than the location of the broken well head. Floating and suspended oil washed onto shore in several areas of the Gulf, as well as non-floating tar balls. Whereas suspended and floating oil degrades over time, tar balls are more persistent in the environment and can be transported hundreds of miles. Oil on the surface of the water could restrict the normal process of atmospheric oxygen mixing into and replenishing oxygen concentrations in the water column. In addition, microbes in the water that break down oil and dispersant also consume oxygen; this could lead to further oxygen depletion. Zooplankton that feed on algae could also be negatively impacted, thus allowing more of the hypoxia-fueling algae to grow.

The highest concern is that the oil spill may have impacted spawning success of species that spawn in the summer months, either by reducing spawning activity or by reducing survival of the eggs and larvae. Effects on the physical environment, such as low oxygen, could lead to impacts on the ability of larvae and post-larvae to survive, even if they never encounter oil. In addition, effects of oil exposure may create sub-lethal effects on the eggs, larva, and early life stages. The stressors could potentially be additive, and each stressor may increase the susceptibility to the harmful effects of the other. The oil from the spill site was not detected in the South Atlantic region, and does not likely pose a threat to the South Atlantic species addressed in this regulatory amendment. However, the effects of the oil spill on fish species would be taken into consideration in future Southeast Data Assessment and Review assessments. Indirect and inter-related effects on the biological and ecological environment of the fisheries in concert with the Deepwater Horizon MC252 oil spill are not well understood. Changes in the population size structure could result from shifting fishing effort to specific geographic segments of populations, combined with any anthropogenically induced natural mortality that may occur from the impacts of the oil spill. The impacts on the food web from phytoplankton, to zooplankton, to mollusks, to top predators may be significant in the future.

6.4 Overall Impacts Expected from Past, Present, and Future Actions

The proposed management actions are summarized in **Chapter 2** of this document. Detailed discussions of the magnitude and significance of the impacts of the alternative on the human environment appear in **Chapter 4** of this document. None of the impacts of the action in this regulatory amendment, in combination with past, present, and future actions have been determined to be significant. Although several other management actions, in addition to this regulatory amendment, are expected to affect snapper grouper species, any additive effects, beneficial and adverse, are not expected to result in a significant level of cumulative impacts.

The proposed actions 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 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 action is not likely to cause loss or destruction of these national marine sanctuaries because the actions are not expected to result in appreciable changes to current fishing practices. Additionally, the proposed action is not likely to change the way in which the snapper grouper fishery is prosecuted; therefore, the actions are not expected to result in adverse impacts on health or human safety beyond the status quo.

6.5 Monitoring and Mitigation

Fishery-independent and fishery-dependent data comprise a significant portion of information used in stock assessments. Fishery-independent data are being collected through the Southeast Fishery Information Survey and the Marine Resources Monitoring Assessment and Prediction Program. The effects of the proposed actions are, and would continue to be, monitored through collection of commercial landings data by all the four states in the South Atlantic Region (Florida, Georgia, South Carolina, and North Carolina). The National Marine Fisheries Service would continue to monitor and collect information on snapper grouper species for stock assessments and stock assessment updates, life history studies, economic and social analyses, and other scientific observations. The proposed action relates to the harvest of indigenous species in the Atlantic, and the activities/regulations being altered does not introduce non-indigenous species, and is not reasonably expected to facilitate the spread of such species through depressing the populations of native species. Additionally, these alternatives do not propose any activity, such as increased ballast water discharge from foreign vessels, which is associated with the introduction or spread on non-indigenous species.

Chapter 7. List of Preparers

Table 6-1. List of interdisciplinary plan team members for the document

Name	Organization	Title
Brian Cheuvront	SAFMC	Deputy Executive Director for Management
John Hadley	SAFMC	IPT Lead/Fishery Biologist/Economist
Christina Wiegand	SAFMC	Social Scientist
Myra Brouwer	SAFMC	Fishery Biologist
Chip Collier	SAFMC	Data Analyst
Rick DeVictor	NMFS/SERO/SF	South Atlantic Branch Chief
Mary Vara	NMFS/SERO/SF	IPT Lead/Fishery Biologist
Alisha Gray-Dileone	NMFS/SERO/SF	Data Analyst
Joelle Godwin	NMFS/SERO/SF	Technical Writer
Mike Jepson	NMFS/SERO/SF	Social Scientist
Denise Johnson	NMFS/SERO/SF	Economist
Nikhil Mehta	NMFS/SERO/SF	Division NEPA Specialist
Jennifer Lee	NMFS/SERO/PR	Protected Resources
David Dale	NMFS/SERO/HC	Habitat
Kyle Shertzer	NMFS/SEFSC	Fishery Biologist
Larry Perruso	NMFS/SEFSC	Economist
Monica Smit-Brunello	NOAA/GC	Attorney

NOAA=National Oceanic and Atmospheric Administration, NMFS = National Marine Fisheries Service, SERO = Southeast Regional Office, SF = Sustainable Fisheries Division, PR = Protected Resources Division, HC = Habitat Conservation Division, SEFSC=Southeast Fisheries Science Center, GC = General Counsel

Chapter 8. Agencies and Persons Consulted

Responsible Agency
NMFS, Southeast Region
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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

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Appendix A. Glossary

Allowable Biological Catch (ABC): Maximum amount of fish stock than can be harvested without adversely affecting recruitment of other components of the stock. The ABC level is typically higher than the total allowable catch, leaving a buffer between the two.

ALS: Accumulative Landings System. NMFS database which contains commercial landings reported by dealers.

Biomass: Amount or mass of some organism, such as fish.

B_{MSY}: Biomass of population achieved in long-term by fishing at F_{MSY}.

Bycatch: Fish harvested in a fishery, but not sold or kept for personal use. Bycatch includes economic discards and regulatory discards, but not fish released alive under a recreational catch and release fishery management program.

Caribbean Fishery Management Council (CFMC): One of eight regional councils mandated in the Magnuson-Stevens Fishery Conservation and Management Act to develop management plans for fisheries in federal waters. The CFMC develops fishery management plans for fisheries off the coast of the U.S. Virgin Islands and the Commonwealth of Puerto Rico.

Catch Per Unit Effort (CPUE): The amount of fish captured with an amount of effort. CPUE can be expressed as weight of fish captured per fishing trip, per hour spent at sea, or through other standardized measures.

Charter Boat: A fishing boat available for hire by recreational anglers, normally by a group of anglers for a short time period.

Cohort: Fish born in a given year. (See year class.)

Control Date: Date established for defining the pool of potential participants in a given management program. Control dates can establish a range of years during which a potential participant must have been active in a fishery to qualify for a quota share.

Constant Catch Rebuilding Strategy: A rebuilding strategy where the allowable biological catch of an overfished species is held constant until stock biomass reaches B_{MSY} at the end of the rebuilding period.

Constant F Rebuilding Strategy: A rebuilding strategy where the fishing mortality of an overfished species is held constant until stock biomass reached BMSY at the end of the rebuilding period.

Directed Fishery: Fishing directed at a certain species or species group.
Discards: Fish captured, but released at sea.

Discard Mortality Rate: The % of total fish discarded that do not survive being captured and released at sea.

Derby: Fishery in which the TAC is fixed and participants in the fishery do not have individual quotas. The fishery is closed once the TAC is reached, and participants attempt to maximize their harvests as quickly as possible. Derby fisheries can result in capital stuffing and a race for fish.

Effort: The amount of time and fishing power (i.e., gear size, boat size, horsepower) used to harvest fish.

Exclusive Economic Zone (EEZ): Zone extending from the shoreline out to 200 nautical miles in which the country owning the shoreline has the exclusive right to conduct certain activities such as fishing. In the United States, the EEZ is split into state waters (typically from the shoreline out to 3 nautical miles) and federal waters (typically from 3 to 200 nautical miles).

Exploitation Rate: Amount of fish harvested from a stock relative to the size of the stock, often expressed as a percentage.

F: Fishing mortality.

Fecundity: A measurement of the egg-producing ability of fish at certain sizes and ages.

Fishery Dependent Data: Fishery data collected and reported by fishermen and dealers.

Fishery Independent Data: Fishery data collected and reported by scientists who catch the fish themselves.

Fishery Management Plan: Management plan for fisheries operating in the federal produced by regional fishery management councils and submitted to the Secretary of Commerce for approval.

Fishing Effort: Usually refers to the amount of fishing. May refer to the number of fishing vessels, amount of fishing gear (nets, traps, hooks), or total amount of time vessels and gear are actively engaged in fishing.

Fishing Mortality: A measurement of the rate at which fish are removed from a population by fishing. Fishing mortality can be reported as either annual or instantaneous. Annual mortality is the percentage of fish dying in one year. Instantaneous is that percentage of fish dying at any one time.

Fishing Power: Measure of the relative ability of a fishing vessel, its gear, and its crew to catch fishes, in reference to some standard vessel, given both vessels are under identical conditions.

$F_{30\%SPR}$: Fishing mortality that will produce a static SPR = 30%.

$F_{45\%SPR}$: Fishing mortality that will produce a static SPR = 45%.

F_{OY}: Fishing mortality that will produce OY under equilibrium conditions and a corresponding biomass of B_{OY}. Usually expressed as the yield at 85% of F_{MSY}, yield at 75% of F_{MSY}, or yield at 65% of F_{MSY}.

F_{MSY}: Fishing mortality that if applied constantly, would achieve MSY under equilibrium conditions and a corresponding biomass of B_{MSY}.

Fork Length (FL): The length of a fish as measured from the tip of its snout to the fork in its tail.

Framework: An established procedure within a fishery management plan that has been approved and implemented by NMFS, which allows specific management measures to be modified via regulatory amendment.

Gear restrictions: Limits placed on the type, amount, number, or techniques allowed for a given type of fishing gear.

Growth Overfishing: When fishing pressure on small fish prevents the fishery from producing the maximum poundage. Condition in which the total weight of the harvest from a fishery is improved when fishing effort is reduced, due to an increase in the average weight of fishes.

Gulf of Mexico Fishery Management Council (GFMC): One of eight regional councils mandated in the Magnuson-Stevens Fishery Conservation and Management Act to develop management plans for fisheries in federal waters. The GFMC develops fishery management plans for fisheries off the coast of Texas, Louisiana, Mississippi, Alabama, and the west coast of Florida.

Headboat: A fishing boat that charges individual fees per recreational angler onboard.

Highgrading: Form of selective sorting of fishes in which higher value, more marketable fishes are retained, and less marketable fishes, which could legally be retained are discarded.

Individual Fishing Quota (IFQ): Fishery management tool that allocates a certain portion of the TAC to individual vessels, fishermen, or other eligible recipients.

Longline: Fishing method using a horizontal mainline to which weights and baited hooks are attached at regular intervals. Gear is either fished on the bottom or in the water column.

Magnuson-Stevens Fishery Conservation and Management Act: Federal legislation responsible for establishing the fishery management councils and the mandatory and discretionary guidelines for federal fishery management plans.

Marine Recreational Information Program (MRIP): Survey operated by NMFS in cooperation with states that collects marine recreational data.

Maximum Fishing Mortality Threshold (MFMT): The rate of fishing mortality above which a stock's capacity to produce MSY would be jeopardized.

Maximum Sustainable Yield (MSY): The largest long-term average catch that can be taken continuously (sustained) from a stock or stock complex under average environmental conditions.

Minimum Stock Size Threshold (MSST): The biomass level below which a stock would be considered overfished.

Modified F Rebuilding Strategy: A rebuilding strategy where fishing mortality is changed as stock biomass increases during the rebuilding period.

Multispecies fishery: Fishery in which more than one species is caught at the same time and location with a particular gear type.

National Marine Fisheries Service (NMFS): Federal agency within NOAA responsible for overseeing fisheries science and regulation.

National Oceanic and Atmospheric Administration: Agency within the Department of Commerce responsible for ocean and coastal management.

Natural Mortality (M): A measurement of the rate at which fish are removed from a population by natural causes. Natural mortality can be reported as either annual or instantaneous. Annual mortality is the percentage of fish dying in one year. Instantaneous is that percentage of fish dying at any one time.

Optimum Yield (OY): The amount of catch that will provide the greatest overall benefit to the nation, particularly with respect to food production and recreational opportunities and taking into account the protection of marine ecosystems.

Overfished: A stock or stock complex is considered overfished when stock biomass falls below the minimum stock size threshold (MSST) (e.g., current biomass < MSST = overfished).

Overfishing: Overfishing occurs when a stock or stock complex is subjected to a rate of fishing mortality that exceeds the maximum fishing mortality threshold (e.g., current fishing mortality rate > MFMT = overfishing).

Quota: % or annual amount of fish that can be harvested.

Recruitment (R): Number or percentage of fish that survives from hatching to a specific size or age.

Recruitment Overfishing: The rate of fishing above which the recruitment to the exploitable stock becomes significantly reduced. This is characterized by a greatly reduced spawning stock, a decreasing proportion of older fish in the catch, and generally very low recruitment year after year.

Scientific and Statistical Committee (SSC): Fishery management advisory body composed of federal, state, and academic scientists, which provides scientific advice to a fishery management council.

Selectivity: The ability of a type of gear to catch a certain size or species of fish.

South Atlantic Fisheries Management Council (Council): One of eight regional councils mandated in the Magnuson-Stevens Fishery Conservation and Management Act to develop management plans for fisheries in federal waters. The SAFMC develops fishery management plans for fisheries off North Carolina, South Carolina, Georgia, and the east coast of Florida.

Spawning Potential Ratio (Transitional SPR): Formerly used in overfished definition. The number of eggs that could be produced by an average recruit in a fished stock divided by the number of eggs that could be produced by an average recruit in an unfished stock. SPR can also be expressed as the spawning stock biomass per recruit (SSBR) of a fished stock divided by the SSBR of the stock before it was fished.

% Spawning Per Recruit (Static SPR): Formerly used in overfishing determination. The maximum spawning per recruit produced in a fished stock divided by the maximum spawning per recruit, which occurs under the conditions of no fishing. Commonly abbreviated as %SPR.

Spawning Stock Biomass (SSB): The total weight of those fish in a stock which are old enough to spawn.

Spawning Stock Biomass Per Recruit (SSBR): The spawning stock biomass divided by the number of recruits to the stock or how much spawning biomass an average recruit would be expected to produce.

Total Allowable Catch (TAC): The total amount of fish to be taken annually from a stock or stock complex. This may be a portion of the Allowable Biological Catch (ABC) that takes into consideration factors such as bycatch.

Total Length (TL): The length of a fish as measured from the tip of the snout to the tip of the tail.

Appendix B. Letter from NMFS SERO to SAFMC

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
263 13th Avenue South
St. Petersburg, Florida 33701-5505
http://sero.nmfs.noaa.gov

F/SER25:FH

September 27, 2017

Dr. Michelle Duval, Chair
South Atlantic Fishery Management Council
4055 Faber Place Drive, Suite 201
North Charleston, South Carolina 29405

Dear Dr. Duval:

NOAA Fisheries has determined management action is necessary for red grouper in the South Atlantic region as the stock is undergoing overfishing and is overfished, and is not making adequate rebuilding progress pursuant to section 304(e) of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act).

In 2010, a Southeast Data, Assessment, and Review benchmark assessment (SEDAR 19) was completed for red grouper. SEDAR 19 determined that red grouper was undergoing overfishing and overfished. In response, the South Atlantic Fishery Management Council (Council) and NOAA Fisheries implemented management measures to end overfishing and begin a 10-year rebuilding plan that started in 2011. In February 2017, a standard assessment was completed, which indicated that the red grouper stock is currently undergoing overfishing and is overfished and cannot rebuild by 2020 (SEDAR 53). The Council's Scientific and Statistical Committee reviewed SEDAR 53 and determined that the assessment is based on the best scientific information available.

Following Council notification that a stock is undergoing overfishing and overfished and is not making adequate rebuilding progress, the Magnuson-Stevens Act requires the Council and NOAA Fisheries to prepare and implement a plan amendment and regulations within two years of the notice to end overfishing immediately and rebuild the affected stock.

NOAA Fisheries recommends that the Council revise the rebuilding plan for South Atlantic red grouper based on the results of SEDAR 53. Two recruitment scenarios were presented in the assessment: long-term (expected) recruitment and low recruitment. Due to the effects of possible episodic recruitment, the Council could consider using the expected recruitment scenario when revising the rebuilding plan and timeframe. Additionally, the Council could take a conservative approach by adopting new annual catch limits based on the low recruitment scenario to increase the likelihood of stock rebuilding.

I look forward to working with the Council to develop a plan to end overfishing and rebuild the red grouper stock.

Sincerely,

Roy E. Crabtree, Ph.D.
Regional Administrator

Cc: F/SEC - Bonnie Ponwith
F/SER2 - Jack McGovern
F/SER25 - Rick DeVictor

Appendix C. Background Document on Red Grouper

Background Document on Red Grouper, presented at the South Atlantic Fishery Management Council meeting during ???, 2017.

Appendix D. History of Management of the Snapper Grouper Fishery of the South Atlantic Region

South Atlantic Snapper Grouper History of Management
Last Updated: 8/2/18.

The snapper grouper fishery is highly regulated; some of the species included in this amendment have been regulated since 1983. The following table summarizes actions in each of the amendments to the original Snapper Grouper Fishery Management Plan (FMP), as well as some events not covered in amendment actions.

*Shaded rows indicate FMP Amendments

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
FMP (1983)	08/31/83	PR: 48 FR 26843 FR: 48 FR 39463	-12" total length (TL) limit – red snapper, yellowtail snapper, red grouper, Nassau grouper; -8" limit – black sea bass; -4" trawl mesh size; -Gear limitations – poisons, explosives, fish traps, trawls; -Designated modified habitats or artificial reefs as Special Management Zones (SMZs).
Regulatory Amendment #1 (1987)	03/27/87	PR: 51 FR 43937 FR: 52 FR 9864	-Prohibited fishing in SMZs except with hand-held hook-and-line and spearfishing gear; -Prohibited harvest of goliath grouper in SMZs.
Amendment #1 (1988a)	01/12/89	PR: 53 FR 42985 FR: 54 FR 1720	-Prohibited trawl gear to harvest fish south of Cape Hatteras, NC and north of Cape Canaveral, FL; -Directed fishery defined as vessel with trawl gear and ≥200 lb s-g on board; -Established rebuttable assumption that vessel with s-g on board had harvested such fish in the exclusive economic zone (EEZ).
Regulatory Amendment #2 (1988b)	03/30/89	PR: 53 FR 32412 FR: 54 FR 8342	-Established 2 artificial reefs off Ft. Pierce, FL as SMZs.
Emergency Rule	8/3/90	55 FR 32257	-Added wreckfish to the fishery management unit (FMU); -Fishing year beginning 4/16/90; -Commercial quota of 2 million pounds; -Commercial trip limit of 10,000 pounds per trip.
Fishery Closure Notice	8/8/90	55 FR 32635	- Fishery closed because the commercial quota of 2 million pounds was reached.

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
Notice of Control Date	09/24/90	55 FR 39039	-Anyone entering federal wreckfish fishery in the EEZ off S. Atlantic states after 09/24/90 was not assured of future access if limited entry program developed.
Regulatory Amendment #3 (1989)	11/02/90	PR: 55 FR 28066 FR: 55 FR 40394	-Established artificial reef at Key Biscayne, FL as SMZ; -Fish trapping, bottom longlining, spear fishing, and harvesting of Goliath grouper prohibited in SMZ.
Amendment #2 (1990a)	10/30/90	PR: 55 FR 31406 FR: 55 FR 46213	-Prohibited harvest/possession of goliath grouper in or from the EEZ; -Defined overfishing for goliath grouper and other species.
Emergency Rule Extension	11/1/90	55 FR 40181	-Extended the measures implemented via emergency rule on 8/3/90.
Amendment #3 (1990b)	01/31/91	PR: 55 FR 39023 FR: 56 FR 2443	-Added wreckfish to the FMU; -Defined optimum yield (OY) and overfishing; -Required permit to fish for, land or sell wreckfish; -Required catch and effort reports from selected, permitted vessel; -Established control date of 03/28/90; -Established a fishing year for wreckfish starting April 16; -Established a process to set annual quota, with initial quota of 2 million pounds; provisions for closure; -Established 10,000 pound trip limit; -Established a spawning season closure for wreckfish from January 15 to April 15; -Provided for annual adjustments of wreckfish management measures.
Notice of Control Date	07/30/91	56 FR 36052	-Anyone entering federal snapper grouper fishery (other than for wreckfish) in the EEZ off S. Atlantic states after 07/30/91 was not assured of future access if limited entry program developed.
Amendment #4 (1991)	01/01/92	PR: 56 FR 29922 FR: 56 FR 56016	-Prohibited gear: fish traps except black sea bass traps north of Cape Canaveral, FL; entanglement nets; longline gear inside 50 fathoms; bottom longlines to harvest wreckfish; powerheads and bangsticks in designated SMZs off S. Carolina. -Defined overfishing/overfished and established rebuilding timeframe: red snapper and groupers ≤ 15 years (year 1 = 1991); other snappers, greater amberjack, black sea bass, red porgy ≤ 10 years (year 1 = 1991); -Required permits (commercial & for-hire) and specified data collection regulations; -Established an assessment group and annual adjustment procedure (framework); -Permit, gear, and vessel id requirements specified for black sea bass traps; -No retention of snapper grouper spp. caught in other fisheries with gear prohibited in snapper grouper fishery if captured snapper grouper had no bag limit or

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
			harvest was prohibited. If had a bag limit, could retain only the bag limit; -8" TL limit – lane snapper; -10" TL limit – vermilion snapper (recreational only); -12" TL limit – red porgy, vermilion snapper (commercial only), gray, yellowtail, mutton, schoolmaster, queen, blackfin, cubera, dog, mahogany, and silk snappers; -20" TL limit – red snapper, gag, and red, black, scamp, yellowfin, and yellowmouth groupers; -28" fork length (FL) limit – greater amberjack (recreational only); -36" FL or 28" core length – greater amberjack (commercial only); -Bag limits – 10 vermilion snapper, 3 greater amberjack -Aggregate snapper bag limit – 10/person/day, excluding vermilion snapper and allowing no more than 2 red snappers; -Aggregate grouper bag limit – 5/person/day, excluding Nassau and goliath grouper, for which no retention (recreational & commercial) is allowed; -Spawning season closure – commercial harvest greater amberjack > 3 fish bag prohibited in April; -Spawning season closure – commercial harvest mutton snapper >snapper aggregate prohibited during May and June; -Charter/headboats and excursion boat possession limits extended.
Amendment #5 (1992a)	04/06/92	PR: 56 FR 57302 FR: 57 FR 7886	For wreckfish: -Established limited entry system with individual transferable quotas (ITQs); -Required dealer to have permit; -Rescinded 10,000 lb. trip limit; -Required off-loading between 8 am and 5 pm; -Reduced occasions when 24-hour advance notice of offloading required for off-loading; -Established procedure for initial distribution of percentage shares of total allowable catch (TAC).
Emergency Rule	8/31/92	57 FR 39365	For Black Sea Bass (bsb): -Modified definition of bsb pot; -Allowed multi-gear trips for bsb; -Allowed retention of incidentally-caught fish on bsb trips.
Emergency Rule Extension	11/30/92	57 FR 56522	For Black Sea Bass: -Modified definition of bsb pot; -Allowed multi-gear trips for bsb; -Allowed retention of incidentally-caught fish on bsb trips.

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
Regulatory Amendment #4 (1992b)	07/06/93	FR: 58 FR 36155	-For Black Sea Bass: -Modified definition of bsb pot; -Allowed multi-gear trips for bsb; -Allowed retention of incidentally-caught fish on bsb trips.
Regulatory Amendment #5 (1992c)	07/31/93	PR: 58 FR 13732 FR: 58 FR 35895	-Established 8 SMZs off South Carolina, where only hand-held, hook-and-line gear and spearfishing (excluding powerheads) was allowed.
Amendment #6 (1993)	06/27/94	PR: 59 FR 9721 FR: 59 FR 27242	-Set up separate commercial TAC levels for golden tilefish and snowy grouper; -Established commercial trip limits for snowy grouper, golden tilefish, speckled hind, and warsaw grouper; -Included golden tilefish in grouper recreational aggregate bag limits; -Prohibited sale of warsaw grouper and speckled hind; -100% logbook coverage upon renewal of permit; -Creation of the *Oculina* Experimental Closed Area; -Data collection needs specified for evaluation of possible future individual fishing quota system.
Amendment #7 (1994a)	01/23/95	PR: 59 FR 47833 FR: 59 FR 66270	-12" FL – hogfish; -16" TL – mutton snapper; -Required dealer, charter and headboat federal permits; -Allowed sale under specified conditions; -Specified allowable gear and made allowance for experimental gear; -Allowed multi-gear trips in NC; -Added localized overfishing to list of problems and objectives; -Adjusted bag limit and crew specs. for charter and head boats; -Modified management unit for scup to apply south of Cape Hatteras, NC; -Modified framework procedure.
Regulatory Amendment #6 (1994b)	05/22/95	PR: 60 FR 8620 FR: 60 FR 19683	-Established actions which applied only to EEZ off Atlantic coast of FL: Bag limits – 5 hogfish/person/day (recreational only), 2 cubera snapper/person/day > 30" TL; 12" TL – gray triggerfish.
Notice of Control Date	04/23/97	62 FR 22995	-Anyone entering federal black sea bass pot fishery off South Atlantic states after 04/23/97 was not assured of future access if limited entry program developed.
Interim Rule Request	1/16/98		-The South Atlantic Fishery Management Council (Council) requested all Amendment 9 measures except black sea bass pot construction changes be implemented as an interim request under the Magnuson-Stevens Act.
Action Suspended	5/14/98		-NMFS informed the Council that action on the interim rule request was suspended.

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Emergency Rule Request	9/24/98		-Council requested Amendment 9 be implemented via emergency rule.
Amendment #8 (1997)	12/14/98	PR: 63 FR 1813 FR: 63 FR 38298	-Established program to limit initial eligibility for snapper grouper fishery: -Must have demonstrated landings of any species in the snapper grouper FMU in 1993, 1994, 1995 or 1996; and have held valid snapper grouper permit between 02/11/96 and 02/11/97; -Granted transferable permit with unlimited landings if vessel landed ≥ 1,000 pounds (lb) of snapper grouper species in any of the years; -Granted non-transferable permit with 225 lb trip limit to all other vessels; -Modified problems, objectives, OY, and overfishing definitions; -Expanded the Council's habitat responsibility; -Allowed retention of snapper grouper species in excess of bag limit on permitted vessel with a single bait net or cast nets on board; -Allowed permitted vessels to possess filleted fish harvested in the Bahamas under certain conditions.
Request not Implemented	1/22/99		-NMFS informed the Council that the final rule for Amendment 9 would be effective 2/24/99; therefore they did not implement the emergency rule.
Regulatory Amendment #7 (1998a)	01/29/99	PR: 63 FR 43656 FR: 63 FR 71793	-Established 10 SMZs at artificial reefs off South Carolina.

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Amendment #9 (1998b)	2/24/99	PR: 63 FR 63276 FR: 64 FR 3624	-Red porgy: 14" TL (recreational and commercial); 5 fish rec. bag limit; no harvest or possession > bag limit, and no purchase or sale, in March and April; -Black sea bass: 10" TL (recreational and commercial); 20 fish rec. bag limit; required escape vents and escape panels with degradable fasteners in bsb pots; -Greater amberjack: 1 fish rec. bag limit; no harvest or possession > bag limit, and no purchase or sale, during April; quota = 1,169,931 lb; began fishing year May 1; prohibited coring; -Specified size limits for several snapper grouper species (indicated in parentheses in inches TL): including yellowtail snapper (12), mutton snapper (16), red snapper (20); red grouper, yellowfin grouper, yellowmouth grouper, and scamp (20) ; -Vermilion snapper: 11" TL (recreational), 12" TL commercial; -Gag: 24" TL (recreational); no commercial harvest or possession > bag limit, and no purchase or sale, during March and April; -Black grouper: 24" TL (recreational and commercial); no harvest or possession > bag limit, and no purchase or sale, during March and April; -Gag and Black grouper: within 5 fish aggregate grouper bag limit, no more than 2 fish may be gag or black grouper (individually or in combination); -All snapper grouper without a bag limit: aggregate recreational bag limit 20 fish/person/day, excluding tomtate and blue runner; -Vessels with longline gear aboard may only possess snowy, warsaw, yellowedge, and misty grouper, and golden, blueline and sand tilefish.
Emergency Action	9/3/99	64 FR 48326	-Reopened the Amendment 8 permit application process.
Emergency Interim Rule	09/08/99, expired 08/28/00	64 FR 48324 and 65 FR 10040	-Prohibited harvest or possession of red porgy.
Amendment #10 Comprehensive Essential Fish Habitat Amendment (1998c)	07/14/00	PR: 64 FR 37082 and 64 FR 59152 FR: 65 FR 37292	-Identified essential fish habitat (EFH) and established habitat areas of particular concern (HAPC) for species in the snapper grouper FMU.

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Amendment #11 Comprehensive Sustainable Fisheries Act Amendment (1998d)	12/02/99	PR: 64 FR 27952 FR: 64 FR 59126	-Maximum sustainable yield (MSY) proxy: goliath and Nassau grouper = 40% static spawning potential ratio (SPR); all other species = 30% static SPR; -OY: hermaphroditic groupers = 45% static SPR; goliath and Nassau grouper = 50% static SPR; all other species = 40% static SPR -Overfished/overfishing evaluations: BSB: overfished (minimum stock size threshold (MSST)=3.72 mp, 1995 biomass=1.33 mp); undergoing overfishing (maximum fishing mortality threshold (MFMT)=0.72, F1991-1995=0.95) Vermilion snapper: overfished (static SPR = 21-27%) Red porgy: overfished (static SPR = 14-19%). Red snapper: overfished (static SPR = 24-32%) Gag: overfished (static SPR = 27%) Scamp: no longer overfished (static SPR = 35%) Speckled hind: overfished (static SPR = 8-13%) Warsaw grouper: overfished (static SPR = 6-14%) Snowy grouper: overfished (static SPR = 5-15%) White grunt: no longer overfished (static SPR = 29-39%) Golden tilefish: overfished (couldn't estimate static SPR) Nassau grouper: overfished (couldn't estimate static SPR) Goliath grouper: overfished (couldn't estimate static SPR) -overfishing level: goliath and Nassau grouper = F>F40% static SPR; all other species: = F>F30% static SPR Approved definitions for overfished and overfishing. MSST = [(1-M) or 0.5 whichever is greater]*B_{MSY}. MFMT = F_{MSY}.
Amendment #12 (2000a)	09/22/00	PR: 65 FR 35877 FR: 65 FR 51248	For Red porgy: -MSY=4.38 mp; OY=45% static SPR; MFMT=0.43; MSST =7.34 mp; rebuilding timeframe=18 years (1999=year 1); -no sale of red porgy during Jan-April; -1 fish bag limit; -50 lb. bycatch commercial trip limit May-December; -Modified management options and list of possible framework actions.
Regulatory Amendment #8 (2000b)	11/15/00	PR: 65 FR 41041 FR: 65 FR 61114	-Established 12 SMZs at artificial reefs off Georgia; revised boundaries of 7 existing SMZs off Georgia to meet CG permit specs; restricted fishing in new and revised SMZs.
Amendment #9 (1998b) resubmitted	10/13/00	PR: 63 FR 63276 FR: 65 FR 55203	-Commercial trip limit for greater amberjack.

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Amendment #13A (2003)	04/26/04	PR: 68 FR 66069 FR: 69 FR 15731	-Extended for an indefinite period the regulation prohibiting fishing for and possessing snapper grouper species within the *Oculina* Experimental Closed Area.
Notice of Control Date	10/14/05	70 FR 60058	-Considered management measures to further limit participation or effort in the commercial fishery for snapper grouper species (excluding wreckfish).
Amendment #13C (2006)	10/23/06	PR: 71 FR 28841 FR: 71 FR 55096	-End overfishing of snowy grouper, vermilion snapper, black sea bass, and golden tilefish. Increase allowable catch of red porgy. Year 1 = 2006; 1. Snowy Grouper Commercial: -Quota = 151,000 lb gutted weight (gw) in year 1, 118,000 lb gw in year 2, and 84,000 lb gw in year 3 onwards. -Trip limit = 275 lb gw in year 1, 175 lb gw in year 2, and 100 lb gw in year 3 onwards; Recreational: -Limit possession to one snowy grouper in 5 grouper per person/day aggregate bag limit; 2. Golden Tilefish Commercial: Quota of 295,000 lb gw, 4,000 lb gw trip limit until 75% of the quota is taken when the trip limit is reduced to 300 lb gw. Do not adjust the trip limit downwards unless 75% is captured on or before September 1; Recreational: Limited possession to 1 golden tilefish in 5 grouper per person/day aggregate bag limit; 3. Vermilion Snapper Commercial: Quota of 1,100,000 lb gw; Recreational: 12” TL size limit. 4. Black Sea Bass Commercial: Quota of 477,000 lb gw in year 1, 423,000 lb gw in year 2, and 309,000 lb gw in year 3 onwards; -Required use of at least 2” mesh for the entire back panel of black sea bass pots effective 6 months after publication of the final rule; -Required black sea bass pots be removed from the water when the quota is met; -Changed fishing year from calendar year to June 1 – May 31; Recreational: Recreational allocation of 633,000 lb gw in year 1, 560,000 lb gw in year 2, and 409,000 lb gw in year 3 onwards. Increased the minimum size limit from 10” to 11” in year 1 and to 12” in year 2; -Reduced recreational bag limit from 20 to 15 per person per day;

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
			-Changed fishing year from the calendar year to June 1 through May 31. 5. Red Porgy Commercial and recreational: -Retained 14" TL size limit and seasonal closure (retention limited to the bag limit); -Specified a commercial quota of 127,000 lb gw and prohibit sale/purchase and prohibit harvest and/or possession beyond the bag limit when quota is taken and/or during January through April; -Increased commercial trip limit from 50 lb ww to 120 red porgy (210 lb gw) during May through December;- -Increased recreational bag limit from one to three red porgy per person per day.
Notice of Control Date	3/8/07	72 FR 60794	-Considered measures to limit participation in the snapper grouper for-hire sector.
Amendment #14 (2007)	2/12/09	PR: 73 FR 32281 FR: 74 FR 1621	-Established eight deepwater Type II marine protected areas (MPAs) to protect a portion of the population and habitat of long-lived deepwater snapper grouper species.
Amendment #15A (2008a)	3/14/08	73 FR 14942	- Established rebuilding plans and status determination criteria for snowy grouper, black sea bass, and red porgy.
Notice of Control Date	12/4/08	74 FR 7849	-Established a control date for the golden tilefish portion of the snapper grouper fishery in the South Atlantic.
Notice of Control Date	12/4/08	74 FR 7849	-Established control date for black sea bass pot sector in the South Atlantic.
Amendment #15B (2008b)	12/16/09, except for the amendments to § 622.18(c) was effective 11/16/2009; the amendment to § 622.10(c) was effective 2/16/2010; and §§ 622.5, 622.8, and 622.18(b)(1)(ii) required OMB approval.	PR: 74 FR 30569 FR: 74 FR 58902	-Prohibited the sale of snapper-grouper harvested or possessed in the EEZ under the bag limits and prohibited the sale of snapper-grouper harvested or possessed under the bag limits by vessels with a Federal charter vessel/headboat permit for South Atlantic snapper-grouper regardless of where harvested; -Reduced the effects of incidental hooking on sea turtles and smalltooth sawfish; -Adjusted commercial permit renewal periods and transferability requirements; -Revised the management reference points for golden tilefish; -Implemented plan to monitor and assess bycatch; -Required a vessel that fished in the EEZ, if selected by NMFS, to carry an observer and install electronic logbook and/or video monitoring equipment provided by NMFS; -Established allocations for snowy grouper (95% commercial & 5% recreational); -Established allocations for red porgy (50% commercial & 50% recreational).

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Amendment #16 (2009a)	7/29/09	PR: 74 FR 6297 FR: 74 FR 30964	-Specified status determination criteria for gag and vermilion snapper; For gag: -Specified interim allocations 51% commercial & 49% recreational; -Recreational and commercial shallow water grouper spawning closure January through April; -Directed commercial quota= 352,940 lb gw; -Reduced 5-fish aggregate grouper bag limit, including tilefish species, to a 3-fish aggregate; -Captain and crew on for-hire trips cannot retain the bag limit of vermilion snapper and species within the 3-fish grouper aggregate; For vermilion snapper: -Specified interim allocations 68% commercial & 32% recreational; -Directed commercial quota split Jan-June=315,523 lb gw and 302,523 lb gw July-Dec; -Reduced bag limit from 10 to 4 and a recreational closed season November through March; -Required possession of dehooking tools when catching snapper grouper species to reduce recreational and commercial bycatch mortality.
Amendment #19 Comprehensive Ecosystem-Based Amendment 1 (CE-BA1) (2009b)	7/22/10	PR: 75 FR 14548 FR: 75 FR 35330	-Amended coral, coral reefs, and live/hardbottom habitat FMP to establish deepwater coral HAPCs; -Created a "shrimp fishery access area" (SFAA) within the Stetson-Miami Terrace CHAPC boundaries; -Created allowable "golden crab fishing areas" with the Stetson-Miami Terrace CHAPC and Pourtales Terrace CHAPC boundaries.
Amendment #17A (2010a)	12/3/10 red snapper closure; circle hooks 3/3/2011	PR: 75 FR 49447 FR: 75 FR 76874	-Required use of non-stainless steel circle hooks when fishing for snapper grouper species with hook-and-line gear and natural bait north of 28 deg. N latitude in the South Atlantic EEZ; -Specified an annual catch limit (ACL) and an accountability measure (AM) for red snapper with management measures to reduce the probability that catches will exceed the stocks' ACL; -Specified a rebuilding plan for red snapper; -Specified status determination criteria for red snapper; -Specified a fishery-independent monitoring program for red snapper. -Implemented an area closure for snapper-grouper species.
Emergency Rule	12/3/10	75 FR 76890	-Delayed the effective date of the area closure for snapper grouper species implemented through Amendment 17A.

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Amendment #17B (2010b)	1/31/11	PR: 75 FR 62488 FR: 75 FR 82280	-Specify ACL of 0 and prohibit fishing for speckled hind and warsaw grouper; -Prohibited harvest of 6 deepwater species seaward of 240 feet to curb bycatch of speckled hind and warsaw grouper (snowy grouper, blueline tilefish, yellowedge grouper, misty grouper, queen snapper, silk snapper). -Specify allocations (97% commercial, 3% recreational), ACLs and AMs for golden tilefish; -Modified management measures as needed to limit harvest to the ACL or ACT; -Updated the framework procedure for specification of total allowable catch; -Specified ACLs, ACTs, and AMs, where necessary, for 9 species undergoing overfishing (snowy grouper, black grouper, black sea bass, red grouper, vermilion snapper, gag, speckled hind, warsaw grouper, golden tilefish);
Notice of control date	1/31/11	76 FR 5325	Anyone entering federal snapper grouper fishery off S. Atlantic states after 09/17/10 was not assured of future access if limited entry program developed.
Regulatory Amendment #9 (2010a)	Bag limit: 6/22/11 Trip limits: 7/15/11	PR: 76 FR 23930 FR: 76 FR 34892	-Established trip limits for vermilion snapper and gag; -Increased trip limit for greater amberjack; - Set black sea bass recreational bag limit at 5 fish per person per day
Regulatory Amendment #10 (2010b)	5/31/11	PR: 76 FR 9530 FR: 76 FR 23728	-Eliminated closed area for snapper grouper species approved in Amendment 17A.
Regulatory Amendment #11 (2011c)	5/10/12	PR: 76 FR 78879 FR: 77 FR 27374	-Eliminated 240 ft harvest prohibition for six deepwater species (snowy grouper, blueline tilefish, yellowedge grouper, queen snapper, silk snapper, misty grouper);
Amendment # 25 Comprehensive Annual Catch Limit Amendment (2011d)	4/16/12	PR: 76 FR 74757 Amended PR: 76 FR 82264 FR: 77 FR 15916	-Reorganize FMUs to 6 complexes (deepwater, jacks, snappers, grunts, shallow-water groupers, porgies) (see final rule for species list); -Established acceptable biological catch (ABC) control rules and established ABCs, ACLs, and AMs for species not undergoing overfishing; -Established jurisdictional ABC allocations between the SAFMC and GMFMC for yellowtail snapper, mutton snapper, and black grouper; -Removed some species from South Atlantic FMU (Tiger grouper, black margate, blue-striped grunt, French grunt, porkfish, smallmouth grunt, queen triggerfish, crevalle, yellow jack, grass porgy, sheepshead, puddingwife);

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			-Designated species as ecosystem component species (schoolmaster, ocean triggerfish, bank triggerfish, rock triggerfish, longspine porgy); -Specified allocations between the commercial and, recreational sectors for species not undergoing overfishing; -Limited the total mortality for federally managed species in the South Atlantic to the ACLs.
Amendment #24 (2011e)	7/11/12	PR: 77 FR 19169 FR: 77 FR 34254	-Rebuilding plan (including MSY, ACLs, AMs, and OY, and allocations) for red grouper.
Amendment #23 Comprehensive Ecosystem-based Amendment 2 (CE-BA2) (2011f)	1/30/12	PR: 76 FR 69230 FR: 76 FR 82183	-Designated the Deepwater MPAs as EFH-HAPCs; -Modify management measures for Octocoral; -Limit harvest of snapper grouper species in SC SMZs to the bag limit; -Modify sea turtle release gear; -Designated new EFP for pelagic Sargassum habitat.
Amendment #18A (2012a)	7/1/12	PR: 77 FR 16991 FR: 77FR3 2408	-Modified the rebuilding strategy, ABC , ACL, ACT for black sea bass; -Limited participation and effort in the black sea bass sector; -Modifications to management of the black sea bass pot sector; -Improved data reporting (accuracy, timing, and quantity of fisheries statistics).
Amendment #20A (2012b)	10/26/12	PR: 77 FR 19165 FR: 77 FR 59129	- Individual transfer quota (ITQ) program for wreckfish: -Defined and reverted inactive shares; -Redistributed reverted shares; -Established a share cap; -Established an appeals process.
Regulatory Amendment #12 (2012c)	10/9/12	PR: 77 FR 42688 FR: 77 FR 61295	-Revised the ACL and OY for golden tilefish; -Revised recreational AMs for golden tilefish;
Yellowtail snapper Emergency Rule	11/7/2012, through 5/6/2013	77 FR 66744	-Increased the commercial ACL for yellowtail snapper from 1,142,589 lb to 1,596,510 lb.
Amendment #18B (2013a)	5/23/13	PR: 77 FR 75093 FR: 77 FR 23858	For Golden Tilefish: -Limited participation and effort in the commercial sector through establishment of a longline endorsement; -Established eligibility requirements and allowed transferability of longline endorsement; -Established an appeals process; -Modified trip limits;

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			-Specified allocations and ACLs for gear groups (longline:85% and hook-and-line:15%);
Amendment #28 (2013b)	8/23/13	PR: 78 FR 25047 FR: 78 FR 44461	-Established regulations to allow harvest of red snapper in the South Atlantic (formula used to compute ACLs, AMs, fishing seasons).
Regulatory Amendment #13 (2013c)	7/17/13	PR: 78 FR 17336 FR: 78 FR 36113	-Revised the ABCs, ACLs (including sector ACLs), and ACTs for 37 species implemented by the Comprehensive ACL Amendment (see final rule for list of species). The revisions may prevent a disjunction between the established ACLs and the landings used to determine if AMs are triggered.
Regulatory Amendment #15 (2013d)	9/12/13	PR: 78 FR 31511 FR: 78 FR 49183	-Modified ACLs and OY for yellowtail snapper; -Modified the gag commercial ACL and AM to remove the requirement that all other shallow water groupers (black grouper, red grouper, scamp, red hind, rock hind, graysby, coney, yellowmouth grouper, and yellowfin grouper) are prohibited from harvest in the South Atlantic when the gag commercial ACL is met or projected to be met.
Regulatory Amendment #18 (2013e)	9/5/13	PR: 78 FR 26740 FR: 78 FR 47574	-Revised ACLs and OY for vermilion snapper; -Modified commercial trip limit for vermilion snapper; -Modified commercial fishing season and recreational closed season for vermilion snapper; -Revised ACLs and OY for red porgy.
Regulatory Amendment #19 (2013f)	ACL: 9/23/13 Pot closure: 10/23/13	PR: 78 FR 39700 FR: 78 FR 58249	-Specified ABC, and adjusted the ACL, recreational ACT and OY for black sea bass; -Implemented an annual closure on the use of black sea bass pots from November 1 to April 30.
Amendment #27 (2013g)	1/27/2014	PR:78 FR 78770 FR: 78 FR 57337	-Established the South Atlantic Council as the responsible entity for managing Nassau grouper throughout its range including federal waters of the Gulf of Mexico; -Modified the crew member limit on dual-permitted snapper grouper vessels; -Modified the restriction on retention of bag limit quantities of some snapper grouper species by captain and crew of for-hire vessels; -Minimized regulatory delay when adjustments to snapper grouper species' ABC, ACLs, and ACTs are needed as a result of new stock assessments; -Removed blue runner from snapper grouper FMP;

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			-Addressed harvest of blue runner by commercial fishermen who do not possess a South Atlantic Snapper Grouper Permit.
Amendment #31 Joint South Atlantic and Gulf of Mexico Generic Headboat Reporting Amendment (2013h)	1/27/2014	PR: 78 FR 59641 FR: 78 FR 78779	-Required electornic reporting for headboat vessels at weekly intervals.
Blueline Tilefish Emergency Rule	4/17/2014 through 10/10/2014 or 4/18/2015	PR: 79 FR 21636 FR:79 FR 61262	-Removed the blueline tilefish portion from the deep-water complex ACL; -Established separate commercial and recreational ACLs and AMs for blueline tilefish.
Generic Dealer Amendment (2013i)	8/7/2014	PR: 79 FR 81 FR: 79 FR 19490	- Modified permitting and reporting requirements for seafood dealers who first receive fish managed by the SA and Gulf through eight FMPs.
Regulatory Amendment #14 (2014a)	12/8/2014	PR: 79 FR 22936 FR: 79 FR 66316	-Modified the commercial and recreational fishing year for greater amberjack; -Modified the commercial and recreational sector fishing years for black sea bass; -Modified the recreational AM for black sea bass; -Modified the recreational AM for vermilion snapper; -Modify the commercial trip limit for gag.
Regulatory Amendment # 21 (2014b)	11/6/2014	PR: 79 FR 44735 FR: 79 FR 60379	-Modified the definition of the overfished threshold (MSST) for red snapper, blueline tilefish, gag, black grouper, yellowtail snapper, vermilion snapper, red porgy, and greater amberjack.
Amendment #29 (2014c)	7/1/2015	NOA: 79 FR 69819 PR: 79 FR 72567 FR: 80 FR 30947	-Updated the ABC control rule to incorporate methodology for determining the ABC of unassessed species; -Adjusted the ABCs for fourteen unassessed snapper-grouper species (see final rule); -Adjusted the ACLs and ACTs for three species complexes and four snapper-grouper species based on revised ABCs; -Established ACLs for unassessed species; -Modified gray triggerfish minimum size limits; -Established a commercial split season and commercial trip limits for gray triggerfish.

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Regulatory Amendment #20 (2014d)	8/20/2015	PR: 80 FR 18797 FR: 80 FR 43033	-Adjusted the recreational and commercial ACLs for snowy grouper; -Adjusted the rebuilding strategy; -Modified the commercial trip limit; -Modified recreational bag limit; -Modified the recreational fishing season.
Amendment #32 (2014e)	3/30/2015	PR: 80 FR 3207 FR: 80 FR 16583	-End overfishing of blueline tilefish; -Removed blueline tilefish from the deepwater complex; -Specified AMs, ACLs, recreational ACLs, commercial trip limit, adjust recreational bag limit for blueline tilefish; -Specified ACLs and revised the AMs for the recreational section of the deepwater complex (yellowedge grouper, silk snapper, misty grouper, queen snapper, sand tilefish, black snapper, and blackfin snapper);
Regulatory Amendment #22 (2015a)	9/11/2015, except for the amendments to §§ 622.190(b) and 622.193(r)(1) which were effective 8/12/2015	PR: 80 FR 31880 FR: 80 FR 48277	-Adjusted ACLs and OY for gag and wreckfish;
Amendment # 33 Dolphin Wahoo Amendment 7 and Snapper Grouper Amendment 33 (2015b)	12/28/2015	NOA:80 FR 55819 PR:80 FR 60601 FR:80 FR 80686	-Allowed dolphin and wahoo fillets to enter the U.S. EEZ after lawful harvest in The Bahamas; -Specified the condition of any dolphin, wahoo, and snapper-grouper fillets; -Described how the recreational bag limit is determined for any fillets; -Prohibited the sale or purchase of any dolphin, wahoo, or snapper-grouper recreationally harvested in The Bahamas; -Specified the required documentation to be onboard any vessels that have these fillets; -Specified transit and stowage provisions for any vessels with fillets.
Amendment #34 Generic Accountability Measures and Dolphin Allocation Amendment (2015c)	2/22/2016	NOA:80 FR 41472 PR:80 FR 58448 FR:81 FR 3731	-Modified AMs for snapper-grouper species (golden tilefish, snowy grouper, gag, red grouper, black grouper, scamp, the shallow-water grouper complex (SASWG: red hind, rock hind, yellowmouth grouper, yellowfin grouper, coney, and graysby), greater amberjack, the jacks complex (lesser amberjack, almaco jack, and banded rudderfish), bar jack, yellowtail snapper, mutton snapper, the snappers complex (cubera snapper, gray snapper, lane snapper, dog snapper, and mahogany snapper), gray triggerfish, wreckfish (recreational sector), Atlantic spadefish,

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			hogfish, red porgy, the porgies complex (jolthead porgy, knobbed porgy, whitebone porgy, scup, and saucereye porgy); -Modified the AM for commercial golden crab fishery; -Adjusted sector allocations for dolphin.
Notice of Control Date	6/15/16	76 FR 66244	-Fishermen entering the federal for-hire recreational sector for the Snapper Grouper fishery after June 15, 2016, will not be assured of future access should a management regime that limits participation in the sector be prepared and implemented.
Amendment #35 (2015d)	6/22/2016	NOA:81 FR 6222 PR:81 FR 11502 FR:81 FR 32249	-Removed black snapper, dog snapper, mahogany snapper, and schoolmaster from the Snapper-Grouper FMP; -Clarified regulations governing the use of Golden Tilefish Longline Endorsements.
Regulatory Amendment #16 (2016a)	12/29/2016 (closure) 1/30/2017 (gear markings)	NOI: 78 FR 72868 PR: 81 FR 53109 FR: 81 FR 95893	-Revise the area where fishing with black sea bass pots is prohibited from Nov.1-April 30. -Add additional gear marking requirements for black sea bass pot gear.
Regulatory Amendment #25 (2016b)	8/12/2016 except changes to blueline tilefish, effective 7/13/2016.	PR: 81 FR 34944 FR: 81 FR 45245	-Revised commercial and recreational ACL for blueline tilefish; -Revised the recreational bag limit for black sea bass; -Revised the commercial and recreational fishing year for yellowtail snapper.
Amendment #36 (2016d)	7/31/17	NOI: 82 FR 810 PR: 82 FR 5512 FR:82 FR 29772	-Established SMZs to enhance protection for snapper-grouper species in spawning condition including speckled hind and warsaw grouper.
Amendment #37 (2016c)	8/24/17	NOI: 80 FR 45641 NOA: 81 FR 69774 PR: 81 FR 91104 FR:82 FR 34584	-Modified the hogfish fishery management unit; -Specified fishing levels for the two South Atlantic hogfish stocks; -Established a rebuilding plan for the Florida Keys/East Florida stock; -Established/revised management measures for both hogfish stocks in the South Atlantic Region, such as size limits, recreational bag limits, and commercial trip limits.
Red Snapper Emergency Rule (2017a)	Effective 11/2/2017, through 11/31/2017. The recreational red snapper season opened on	FR: 82 FR 50839	-Allowed for the limited harvest and possession of red snapper in 2017 by changing the process used to set the ACL, as requested by the Council; -These rules also announced the opening and closing dates of the 2017 recreational fishing season and the opening date for the 2017 commercial fishing season for red snapper

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	11/3/2017, and closed on 11/6/2017; then reopened on 11/10/2017, and closed on 11/13/2017. The commercial red snapper season opened on 11/2/2017.		
Golden Tilefish Interim Rule (2017b)	1/2/2018 through 7/1/2018 and 7/2/2018 through 1/3/2019	PR: 82 FR 50101 FR: 83 FR 65 FR EXT: 83 FR 28387	-Reduced the golden tilefish total ACL, the commercial and recreational sector ACLs, and the quotas for the hook-and-line and longline components of the commercial sector.
Amendment #41 (2017c)	2/10/2018	NOA:82 FR 44756 PR:82 FR 49167 FR:83 FR 1305	For mutton snapper: -Updated the MSY, ABC, ACL, OY, MSST; -Designated spawning months of April through June for regulatory purposes; -Revised management measures including the minimum size limit (18 inches total length), recreational bag limit (five mutton snapper per person per day within the ten-snapper aggregate), and commercial trip limit (500 pounds whole weight during January through March and July through December; and during the April through June spawning season, of five mutton snapper per person per day, or five mutton snapper per person per trip, whichever is more restrictive).
Amendment #43 (2017d)	7/26/2018	NOI:82 FR 1720 NOA: 83 FR 16282 PR:83 FR 22939 FR:83 FR35428	-Actions would address overfishing of red snapper and recreational reporting.
Amendment #39 (Generic For-Hire Reporting Amendment) (2017e)	TBD	NOA:83 FR 11164 PR:83 FR 14400	-Weekly electronic reporting for charter vessel operators with a federal for-hire permit; -Reduce the time allowed for headboat operators to complete electronic reports; -Requires location reporting by charter vessels with the same detail currently required for headboat vessels.
Abbreviated Framework 1: Red Grouper (2017f)	8/27/2018	PR:83 FR 14234 FR:83 FR35435	-Adjust the ACLs for South Atlantic red grouper in response to the results of the latest stock assessment.

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Amendment #26 (Bycatch Reporting Amendment)	TBD	TBD	-Modify bycatch and discard reporting for commercial and for-hire vessels.
Regulatory Amendment 26 (Vision Blueprint Recreational)	TBD	TBD	-Establish deep-water species aggregate, establish recreational season for dee-water species, modify aggregate bag limit for deep-water species aggregate and 20-fish aggregate, reduce the minimum size limit for gray triggerfish off east FL (recreational) & remove the minimum size limit (recreational) for deep-water snappers (silk, queen, blackfin)
Regulatory Amendment 27 (Vision Blueprint Commercial)	TBD	TBD	-Commercial split seasons (snowy grouper, greater amberjack, red porgy), trip limit modifications (blueline tilefish, vermilion snapper), trip limit for Other Jacks Complex, minimum size limit (commercial only) for almaco jack; reduce minimum size limit for gray triggerfish off east FL & remove the minimum size (commercial) limit for deep-water snappers (silk, queen, blackfin)
Regulatory Amendment 29	TBD	TBD	-Best fishing practices & powerheads
Regulatory Amendment 30	TBD	TBD	-Revise the rebuilding schedule for red grouper -Modify the seasonal prohibition on recreational and commercial harvest of red grouper in the Exclusive Economic Zone off South Carolina and North Carolina -Establish a commercial trip limit for red grouper
Regulatory Amendment 32	TBD	TBD	-Revise accountability measures for yellowtail snapper to reduce the possibility of in-season closures.
Amendment 42	TBD	TBD	-Modification to sea turtle release gear and SG framework
Amendment 47	TBD	TBD	-Modifications to snapper grouper for-hire permits

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SAFMC (South Atlantic Fishery Management Council). 2013f. Regulatory Amendment 19 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2013g. Amendment 27 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2013h. Joint Headboat Reporting Amendment (Amendment 31). South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2013i. Modifications to federally permitted seafood dealer reporting requirements. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2014a. Regulatory Amendment 14 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2014b. Regulatory Amendment 21 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2014c. Amendment 29 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2014d. Regulatory Amendment 20 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2014e. Amendment 32 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2015a. Regulatory Amendment 15 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2015b. Amendment 33 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2015c. Amendment 34 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2015d. Amendment 35 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2016a. Regulatory Amendment 16 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2016b. Regulatory Amendment 25 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2016c. Amendment 37 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2016d. Amendment 36 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2017a. Amendment 41 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2017b. Modifications to Charter Vessel and Headboat Reporting Requirements (Generic For-hire Reporting Amendment, Snapper Grouper Amendment 39). South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

Appendix E. Regulatory Impact Review (RIR)

Appendix F. Regulatory Flexibility Analysis (RFA)

Appendix G. Other Applicable Law

1.1 Administrative Procedure Act (APA)

All federal rulemaking is governed under the provisions of the APA (5 U.S.C. Subchapter II), which establishes a "notice and comment" procedure to enable public participation in the rulemaking process. Among other things under the APA, the National Marine Fisheries Service (NMFS) is required to publish notification of proposed rules in the *Federal Register* and to solicit, consider and respond to public comment on those rules before they are finalized. The APA also establishes a 30-day wait period from the time a final rule is published until it takes effect, with some exceptions. The proposed rule associated with this action will have a request for public comments, which complies with the APA, and upon publication of the final rule, unless the rule falls within an APA exception, there will be a 30-day wait period before the regulations are effective.

1.2 Information Quality Act (IQA)

The IQA (Section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Public Law 106-443)) which took effect October 1, 2002, directed the Office of Management and Budget (OMB) to issue government-wide guidelines that "provide policy and procedural guidelines to federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information disseminated by federal agencies." OMB directed each federal agency to issue its own guidelines, establish administrative mechanisms allowing affected persons to seek and obtain correction of information that does not comply with OMB guidelines, and report periodically to OMB on the number and nature of complaints. The NOAA Section 515 Information Quality Guidelines require a series of actions for each new information product subject to the IQA. The actions in this amendment are based on the best available scientific information available and made a broad presentation thereof. The information contained in this document was developed using best available scientific information. Therefore, this document is in compliance with the IQA.

1.3 Coastal Zone Management Act (CZMA)

Section 307(c)(1) of the federal CZMA of 1972 requires that all federal activities that directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. While it is the goal of the Council to have management measures that complement those of the states, federal and state administrative procedures vary and regulatory changes are unlikely to be fully instituted at the same time. The Council believes the actions in this regulatory amendment are consistent to the maximum extent practicable with the Coastal Zone Management Plans of Florida, Georgia, South Carolina, and North Carolina. Pursuant to Section 307 of the CZMA, this determination will be submitted to the responsible state agencies who administer the approved Coastal Zone Management Programs in the States of Florida, South Carolina, Georgia, and North Carolina.

1.4 Endangered Species Act (ESA)

The ESA of 1973 (16 U.S.C. Section 1531 et seq.) requires that federal agencies must ensure actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of threatened or endangered species or the habitat designated as critical to their survival and recovery. The ESA requires NMFS to consult with the appropriate administrative agency (itself for most marine species, and the U.S. Fish and Wildlife Service for all remaining species) when proposing an action that may affect threatened or endangered species or adversely modify critical habitat. Consultations are necessary to determine the potential impacts of the proposed action. They are concluded informally when proposed actions may affect but are "not likely to adversely affect" threatened or endangered species or designated critical habitat. Formal consultations, resulting in a biological opinion, are required when proposed actions may affect and are "likely to adversely affect" threatened or endangered species or adversely modify designated critical habitat.

On December 1, 2016, NMFS completed a new biological opinion on the snapper-grouper fishery of the South Atlantic Region. In this biological opinion, NMFS concluded that the snapper grouper fishery's continued authorization is not likely to jeopardize the continued existence of the NARW, loggerhead sea turtle Northwest Atlantic DPSs, leatherback sea turtle, Kemp's ridley sea turtle, green sea turtle North Atlantic DPS, green sea turtle South Atlantic DPS, hawksbill sea turtle, smalltooth sawfish U.S. DPS, or Nassau grouper. NMFS concluded that the proposed action is not likely to adversely affect designated critical habitat or other ESA-listed species in the South Atlantic Region. Refer to **Section 3.2.5 (Protected Species**) for more information on species, or DPSs of species, protected by federal law that may occur in the EEZ of the South Atlantic Region, or specific analyses ("Section 7 consultations") conducted by NMFS to evaluate the potential adverse effects from the South Atlantic snapper grouper fishery on species and critical habitat protected under the ESA.

1.5 Executive Order 12612: Federalism

E.O. 12612 requires agencies to be guided by the fundamental federalism principles when formulating and implementing policies that have federalism implications. The purpose of the Order is to guarantee the division of governmental responsibilities between the federal government and the states, as intended by the framers of the Constitution. No federalism issues have been identified relative to the actions proposed in this document and associated regulations. Therefore, preparation of a Federalism assessment under E.O. 12612 is not necessary.

1.6 Executive Order 12866: Regulatory Planning and Review

E.O. 12866, signed in 1993, requires federal agencies to assess the costs and benefits of their proposed regulations, including distributional impacts, and to select alternatives that maximize net benefits to society. To comply with E.O. 12866, NMFS prepares a Regulatory Impact Review (RIR) for all fishery regulatory actions that implement a new fishery management plan South Atlantic Snapper Grouper (FMP) or that significantly amend an existing plan. RIRs provide a comprehensive analysis of the costs and benefits to society associated with proposed regulatory actions, the problems and policy objectives prompting the regulatory proposals, and the major alternatives that could be used to solve the problems.

The reviews also serve as the basis for the agency's determinations as to whether proposed regulations are a "significant regulatory action" under the criteria provided in E.O. 12866 and whether

proposed regulations will have a significant economic impact on a substantial number of small entities in compliance with the Regulatory Flexibility Act. A regulation is significant if it is likely to result in an annual effect on the economy of at least $100,000,000 or if it has other major economic effects. In accordance with E.O. 12866, the following is set forth by the Council: (1) this rule is not likely to have an annual effect on the economy of more than $100 million or to adversely affect in a material way the economy, a sector of the economy, productivity, jobs, the environment, public health or safety, or state, local, or tribal governments or communities; (2) this rule is not likely to create any serious inconsistencies or otherwise interfere with any action taken or planned by another agency; (3) this rule is not likely to materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights or obligations of recipients thereof; (4) this rule is not likely to raise novel or policy issues arising out of legal mandates, or the principles set forth in the Executive Order; and (5) this rule is not controversial.

This regulatory amendment includes the RIR as Appendix E.

1.7 Executive Order 12898: Environmental Justice

E.O. 12898 requires that "to the greatest extent practicable and permitted by law…each federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority populations and low-income populations in the United States and its territories and possessions."

The alternatives being considered in this document are not expected to result in any disproportionate adverse human health or environmental effects to minority populations or low-income populations of Florida, North Carolina, South Carolina, or Georgia, rather the impacts would be spread across all participants in the snapper grouper fishery regardless of race or income. A detailed description of the communities impacted by the actions contained in this document and potential socioeconomic impacts of those actions are contained in **Chapter 3** and Chapter **4** of this document

1.8 Executive Order 12962: Recreational Fisheries

E.O. 12962 requires federal agencies, in cooperation with states and tribes, to improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities through a variety of methods. Additionally, the Order establishes a seven-member National Recreational Fisheries Coordination Council responsible for, among other things, ensuring that social and economic values of healthy aquatic systems that support recreational fisheries are considered by federal agencies in the course of their actions, sharing the latest resource information and management technologies, and reducing duplicative and cost-inefficient programs among federal agencies involved in conserving or managing recreational fisheries. The National Recreational Fisheries Coordination Council also is responsible for developing, in cooperation with federal agencies, states and tribes, a Recreational Fishery Resource Conservation Plan - to include a five-year agenda. Finally, the Order requires NMFS and the U.S. Fish and Wildlife Service to develop a joint agency policy for administering the ESA.

The alternatives considered in this document are consistent with the directives of E.O. 12962.

1.9 Executive Order 13089: Coral Reef Protection

E.O. 13089, signed by President William Clinton on June 11, 1998, recognizes the ecological, social, and economic values provided by the Nation's coral reefs and ensures that federal agencies are protecting these ecosystems. More specifically, the Order requires federal agencies to identify actions that may harm U.S. coral reef ecosystems, to utilize their program and authorities to protect and enhance the conditions of such ecosystems, and to ensure that their actions do not degrade the condition of the coral reef ecosystem.

The alternatives considered in this document are consistent with the directives of E.O. 13089.

1.10 Executive Order 13158: Marine Protected Areas (MPAs)

E.O. 13158 was signed on May 26, 2000, to strengthen the protection of U.S. ocean and coastal resources through the use of Marine Protected Areas. The E.O. defined MPAs as "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." It directs federal agencies to work closely with state, local and non- governmental partners to create a comprehensive network of MPAs "representing diverse U.S. marine ecosystems, and the Nation's natural and cultural resources."

The alternatives considered in this document are consistent with the directives of E.O. 13158.

1.11 Marine Mammal Protection Act (MMPA)

The MMPA established a moratorium, with certain exceptions, on the taking of marine mammals in U.S. waters and by U.S. citizens on the high seas. It also prohibits the importing of marine mammals and marine mammal products into the United States. Under the MMPA, the Secretary of Commerce (authority delegated to NMFS) is responsible for the conservation and management of cetaceans and pinnipeds (other than walruses). The Secretary of the Interior is responsible for walruses, sea otters, polar bears, manatees, and dugongs. Part of the responsibility that NMFS has under the MMPA involves monitoring populations of marine mammals to make sure that they stay at optimum levels. If a population falls below its optimum level, it is designated as "depleted." A conservation plan is then developed to guide research and management actions to restore the population to healthy levels.

In 1994, Congress amended the MMPA, to govern the taking of marine mammals incidental to commercial fishing operations. This regulatory amendment required the preparation of stock assessments for all marine mammal stocks in waters under U.S. jurisdiction; development and implementation of take-reduction plans for stocks that may be reduced or are being maintained below their optimum sustainable population levels due to interactions with commercial fisheries; and studies of pinniped-fishery interactions. The MMPA requires a commercial fishery to be placed in one of three categories, based on the relative frequency of incidental serious injuries and mortalities of marine mammals. Category I designates fisheries with frequent serious injuries and mortalities incidental to commercial fishing; Category II designates fisheries with occasional serious injuries and mortalities; and Category III designates fisheries with a remote likelihood or no known serious injuries or mortalities.

Under the MMPA, to legally fish in a Category I and/or II fishery, a fisherman must take certain steps. For example, owners of vessels or gear engaging in a Category I or II fishery, are required to obtain a marine mammal authorization by registering with the Marine Mammal Authorization Program (50 CFR 229.4). They are also required to accommodate an observer if requested (50 CFR 229.7(c)) and they must comply with any applicable take reduction plans. The commercial hook-and-line components of the South Atlantic snapper grouper fishery (i.e., bottom longline, bandit gear, and handline), which targets snapper grouper species are listed as part of a Category III fishery in the proposed List of Fisheries (LOF) for 2017 (81 FR 54019, August 15, 2016) because there have been no documented interactions between these gear and marine mammals. The action in this EA are not expected to negatively impact the provisions of the MMPA.

1.12 National Environmental Policy Act (NEPA)

This document has been written and organized in a manner that meets NEPA requirements, and thus is a consolidated NEPA document, including an EA, as described in NOAA Administrative Order (NAO) 216- 6, Section 6.03a.2.

Purpose and Need for Action

The purpose and need for this action are described in **Chapter 1**.

Alternatives

The alternatives for this action are described in **Chapter 2**.

Affected Environment

The affected environment is described in **Chapter 3**.

Impacts of the Alternatives

The impacts of the alternatives on the environment are described in **Chapter 4**.

1.13 National Marine Sanctuaries Act (NMSA)

Under the NMSA (also known as Title III of the Marine Protection, Research and Sanctuaries Act of 1972), as amended, the U.S. Secretary of Commerce is authorized to designate National Marine Sanctuaries to protect distinctive natural and cultural resources whose protection and beneficial use requires comprehensive planning and management. The National Marine Sanctuary Program is administered by the Sanctuaries and Reserves Division of NOAA. The NMSA provides authority for comprehensive and coordinated conservation and management of these marine areas. The National Marine Sanctuary Program currently comprises 13 sanctuaries around the country, including sites in American Samoa and Hawaii. These sites include significant coral reef and kelp forest habitats, and breeding and feeding grounds of whales, sea lions, sharks, and sea turtles. The three sanctuaries in the

South Atlantic exclusive economic zone are the USS Monitor, Gray's Reef, and Florida Keys National Marine Sanctuaries.

The alternatives considered in this document are not expected to have any adverse impacts on the resources managed by the National Marine Sanctuaries.

1.14 Paperwork Reduction Act (PRA)

The purpose of the PRA is to minimize the burden on the public. The PRA is intended to ensure that the information collected under the proposed action is needed and is collected in an efficient manner (44 U.S.C. 3501 (1)). The authority to manage information collection and record keeping requirements is vested with the Director of the Office of Management and Budget (OMB). This authority encompasses establishment of guidelines and policies, approval of information collection requests, and reduction of paperwork burdens and duplications. The PRA requires NMFS to obtain approval from the OMB before requesting most types of fishery information from the public. The actions in this regulatory amendment do not trigger the PRA.

1.15 Regulatory Flexibility Act (RFA)

The RFA of 1980 (5 U.S.C. 601 et seq.) requires federal agencies to assess the impacts of regulatory actions implemented through notice and comment rulemaking procedures on small businesses, small organizations, and small governmental entities, with the goal of minimizing adverse impacts of burdensome regulations and record-keeping requirements on those entities. Under the RFA, NMFS must determine whether a proposed fishery regulation would have a significant economic impact on a substantial number of small entities. If not, a certification to this effect must be prepared and submitted to the Chief Counsel for Advocacy of the Small Business Administration. Alternatively, if a regulation is determined to significantly impact a substantial number of small entities, the RFA requires the agency to prepare an initial and final Regulatory Flexibility Analysis to accompany the proposed and final rule, respectively. These analyses, which describe the type and number of small businesses, affected, the nature and size of the impacts, and alternatives that minimize these impacts while accomplishing stated objectives, must be published in the *Federal Register* in full or in summary for public comment and submitted to the chief counsel for advocacy of the Small Business Administration. Changes to the RFA in June 1996 enable small entities to seek court review of an agency's compliance with the RFA's provisions.

As NMFS has determined whether a proposed fishery regulation would have a significant economic impact on a substantial number of small entities, a certification to this effect will be prepared and submitted to the Chief Counsel for Advocacy of the Small Business Administration.

This regulatory amendment includes the RFA as **Appendix F**.

1.16 Small Business Act (SBA)

Enacted in 1953, the SBA requires that agencies assist and protect small-business interests to the extent possible to preserve free competitive enterprise. The objectives of the SBA are to foster business

ownership by individuals who are both socially and economically disadvantaged; and to promote the competitive viability of such firms by providing business development assistance including, but not limited to, management and technical assistance, access to capital and other forms of financial assistance, business training, and counseling, and access to sole source and limited competition federal contract opportunities, to help firms achieve competitive viability. Because most businesses associated with fishing are considered small businesses, NMFS, in implementing regulations, must make an assessment of how those regulations will affect small businesses. The alternatives considered in this document are consistent with the directives of the SBA.

1.17 Public Law 99-659: Vessel Safety

Public Law 99-659 amended the Magnuson-Stevens Fishery Conservation and Management Act to require that a FMP or FMP regulatory amendment must consider, and may provide for, temporary adjustments (after consultation with the U.S. Coast Guard and persons utilizing the fishery) regarding access to a fishery for vessels that would be otherwise prevented from participating in the fishery because of safety concerns related to weather or to other ocean conditions. No vessel would be forced to participate in South Atlantic fisheries under adverse weather or ocean conditions as a result of the imposition of management regulations proposed in this regulatory amendment. No concerns have been raised by South Atlantic fishermen or by the U.S. Coast Guard that the proposed management measures directly or indirectly pose a hazard to crew or vessel safety under adverse weather or ocean conditions.

Appendix H. Data Analysis

INTRODUCTION

The South Atlantic Fishery Management Council (South Atlantic Council) manages red grouper from federal waters at the Virginia/North Carolina border through the Atlantic side of the Florida Keys under the Fishery Management Plan (FMP) for the Snapper-Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP). Regulatory Amendment 30 (Regulatory Amendment 30) to the Snapper Grouper FMP contains actions to address rebuilding of the red grouper population.

1.1 Recreational Data Analyses of Action 2 (Recreational Seasonal Prohibition) Analysis

ANALYSIS

The South Atlantic Council chose to focus on actions that would reduce harvest of potentially spawning adults off North and South Carolina. Fishermen in those states have indicated red grouper continue to spawn in May and June. Abbreviated Framework Amendment 1 (Abbreviated Framework 1) to the Snapper Grouper FMP recommends a recreational annual catch limit (ACL) of less than 100,000 pounds starting in 2018 (**Table H-1**) based on the results of SEDAR 53, which is the latest red grouper stock assessment (SEDAR 2017). As of 2013, the MRFSS survey was phased out and replaced by the Marine Recreational Information Program (MRIP). MRIP is a more scientifically sound methodology for estimating catch because it removes the potential for biases when gathering data, resulting in more accurate catch estimates. The final ACLs are currently based on the results of the 2017 stock assessment, which included MRIP landings, and therefore MRIP landings were used for this analysis to ensure landings were comparable to how the ACL was set. The recreational ACL remains at 56% of the total ACL based on Amendment 24 (SAFMC 2011). The recommended ACLs are a reduction from the previous recreational ACL, which was 436,800 pounds whole weight. Based on the previous recreational ACL, the recreational sector has not caught the ACL since 2012 and rarely exceeded harvesting greater than 30% of the limit. However, the recreational landings have been exceeding the recommended recreational ACL in Abbreviated Framework 1 from 2015 to 2017.

The analysis described below estimates the potential effects of the proposed recreational management measure on recreational harvest of red grouper in the South Atlantic Region. Recreational management measure alternatives under Action 2 include an adjustment to the seasonal prohibition of red grouper.

Table H-1. Annual recreational red grouper annual catch limit (ACL) in pounds whole weight (lbs ww) recommended in Abbreviated Framework 1 to the Snapper Grouper FMP.

Year	Recreational ACL (lbs ww)
2018	77,840
2019	84,000
2020 until modified	90,720

Table H-2. Recreational red grouper landings in the South Atlantic Region, 2015 to 2017.

Year	Recreational Landings (lbs ww)
2015	203,937
2016	198,614
2017	141,067

DATA

Red grouper landings data from 2015 to 2017 were provided by the National Marine Fisheries Service (NMFS) with the Recreational ACL file (6/11/2018). The spreadsheet includes landings in number and whole weight of fish by wave and state for charter boats, headboats, and private vessels. The landings data for charter boats and private vessels were collected through the Marine Recreational Information Program (MRIP) and headboat data were collected through the Southeast Region Headboat Survey (SRHS). MRIP data were not adjusted for the two new calibrations (Fishing Effort Survey (FES) and Access Point Angler Intercept Survey (APAIS)) because the recommended ACL values in Abbreviated Framework 1 did not include these calibrations. The weight of fish collected through MRIP was estimated using the weight estimation procedure created by the Southeast Fishery Science Center.

Data sets from MRIP and SRHS were investigated to determine potential effects of seasonal prohibition on the number of released red grouper. Previously released fish could be added catch due to opening of January (**Alternative 2, Sub-Alternative 2b**) and February (**Alternative 2, Sub-Alternative 2c**). However, there were no reported releases of red grouper in January and February off North and South Carolina in MRIP and SRHS data sets from 2015 to 2017 (personal communication with NMFS, Fisheries Statistics Division, 7/12/2018 and personal communication with NMFS, Southeast Region Headboat Survey, 7/13/2018).

Landings data were limited for red grouper in both surveys. In some waves, landings data from the SRHS are confidential. Landings data from the SRHS were aggregated with MRIP landings by two-month period (waves) to prevent confidentiality issues. The landings in the January/February and March/April were still confidential and combined landings were averaged to display average percent of landings by month.

To determine season length based on the sub-alternatives, daily catch rates were developed for each two-month period. The catch rates were summed by the number of open days in each wave until the new ACL was met. This was done for each year and an average closure date was calculated based on closure date for 2015 to 2017. The season length was compared to the ACL for 2019 (84,000 lbs ww) since this is the earliest year the ACL could be in place.

RESULTS

Landings of red grouper occur throughout the year. The highest typically occurred in November and December followed by May and June (**Figure H-1**). The lowest landings occurred from January through April.

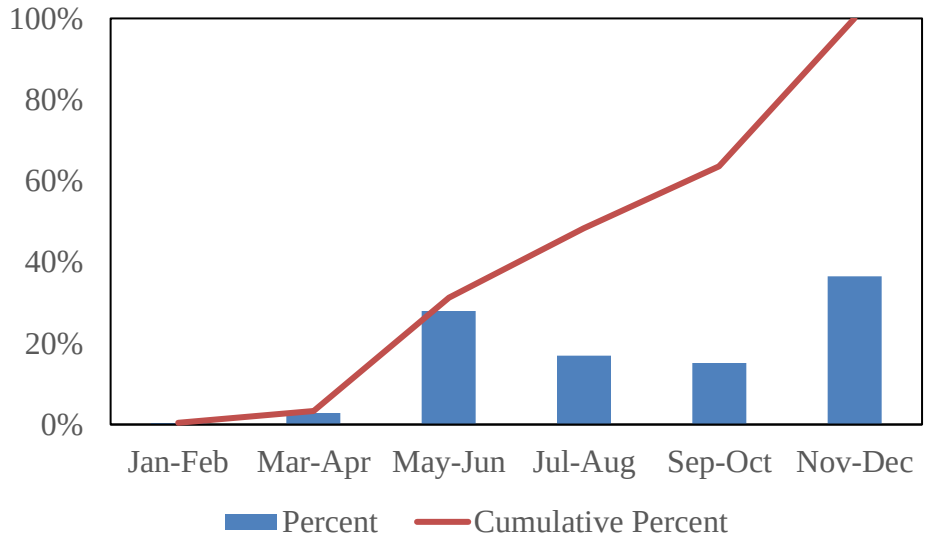

Figure H-1. Percent and cumulative percent of red grouper landings by wave for the South Atlantic recreational sector (charter boat, headboat, and private vessels) from 2015 to 2017.

Landings were predicted to be reduced by closing different months off North and South Carolina by less than 1% for each of the sub-alternatives (**Table H-3**). Since there were no red grouper reported as being released, no fish were added back to the catch for potentially opening January or February. **Alternative 2, Sub-Alternative 2c** had the greatest reduction in catch. Reductions under all the scenarios were less than 1% of the catch. .

Table H-3. Projected recreational red grouper landings (pounds whole weight, lbs ww) that would have occurred 2015 -2017 under the proposed alternatives and sub-alternatives by modifying the recreational seasonal prohibition for red grouper.

Alternatives	Projected Landings (lbs ww)
Alternative 1 (No Action)	181,206
Sub-Alternative 2a (Jan-May)	**180,913**
Sub-Alternative 2b (Feb-May)	180,913
Sub Alternative 2c (Mar-Jun)	180,620

The projected landings for all alternatives and sub-alternatives exceed the proposed ACL from Abbreviated Framework 1. Based on the average landings from 2015 to 2017, a closure due to reaching the ACL would occur in August in 2019 and September in 2020 and beyond (**Figure H-2**). Because the difference between each of the alternatives was less than 1,000 pounds whole weight, the sub-alternatives differed very little from the status quo. The sub-alternatives were predicted to increase the season by one day up to a week. When single years were compared to the proposed ACLs, the closure months ranged from June to November.

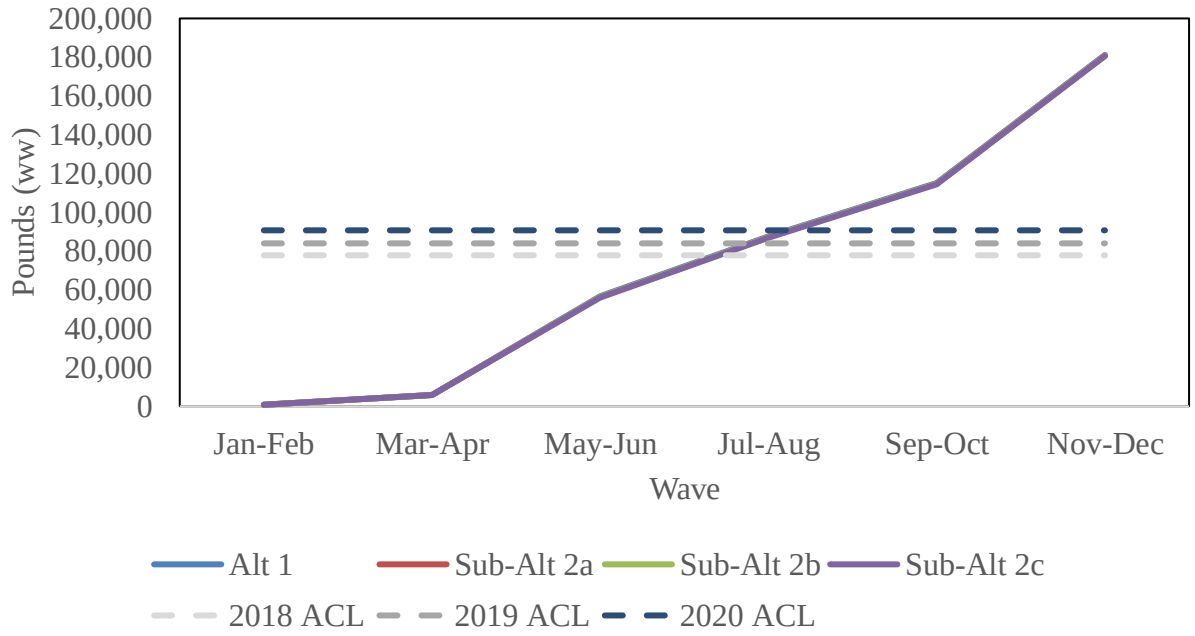

Figure H-2. Projected cumulative recreational red grouper landings (pounds whole weight (lbs ww) under the proposed alternatives and sub-alternatives and the proposed recreational red grouper ACL from 2018, 2019, and 2020 and beyond.

1.2 Commercial Data Analyses of Action 3 (Commercial Seasonal Prohibition) and Action 4 (Commercial Trip Limit)

1.2.1 Action 3: Commercial Seasonal Prohibition Analysis

Since 2012, landings for the commercial sector have not reached their sector ACL. Abbreviated Framework 1, which addresses red grouper in the South Atlantic, reduced the ACLs for South Atlantic red grouper in response to the results of the latest assessment (SEDAR 53). Additionally, Action 3 of Regulatory Amendment 30 is proposing a modification to the seasonal prohibition on commercial harvest, possession, sale and purchase of red grouper in the Exclusive Economic Zone (EEZ) off South Carolina and North Carolina (**Table H-4**). The analysis described below investigates changes to landings from the potential regulation changes and how these actions might impact the commercial sector's likelihood of meeting or exceeding the ACL.

Table H-4. South Atlantic red grouper commercial season prohibition alternatives stated in Action 3 of Regulatory Amendment 30. Preferred Alternatives are indicated in bold.

Action 3 Alternatives:	**Season prohibition:**
Alternative 1 (No Action)	January – April
Alternative 2	January – April in FL and GA only
Sub-Alternative 2a	**Jan – May in NC and SC only**
Sub-Alternative 2b	Feb – May in NC and SC only
Sub-Alternative 2c	Mar – June in NC and SC only

Final commercial landings for 2007-2009 and 2014-2016 were provided from the Southeast Fisheries Science Center (SEFSC) on October 5, 2017, and final 2017 commercial landings were provided on June 26, 2018 (**Table H-5**). South Atlantic commercial red grouper landings from 2015, 2016, 2017, and average 2015-2017 are summarized in **Figure H-3**. Average landings from 2015-2017 were used as a proxy for future landings. The months of Jan-Apr were closed to all shallow-water grouper through Amendment 16 (SAFMC 2009) on July 29, 2009, and therefore future landings are assumed to be either zero or negligible during these months for Florida and Georgia. Backfilling landings for North Carolina and South Carolina for the Jan-Apr closed time period was required to provide an estimate of landings during this period if the fishery was open. Estimates of predicted landings for the Jan-Apr time period are based on the mean ratios of Jan–April to May from 2007-2009, and ranged between 38 and 69% of May landings. These years were used because they were the last three completely open fishing years for red grouper stocks for those months. For example, the January to May mean ratio was 38.38% and applied to the 2015-2017 mean landings in May (7,935 lb ww) resulted in projected landings of 3,047 lbs ww for January for North Carolina and South Carolina. Landings in the Jan-Apr period are projected to be relatively high; however, this analytical approach does not account for the potential redistribution of peak effort to May following the implementation of the Jan-Apr closure in 2009, nor does it account for potential declines in catch rates in the May-Dec period if the fishery opened earlier in the calendar year. Thus, it is likely the projected landings presented in **Figure H-3** are an upper bound for what might be caught if the closure months were modified.

Table H-5. Commercial red grouper landings in the South Atlantic Region, 2015 to 2017.

Year	Commercial Red Grouper Landings (lbs ww)
2015	103,360
2016	52,290
2017	40,490

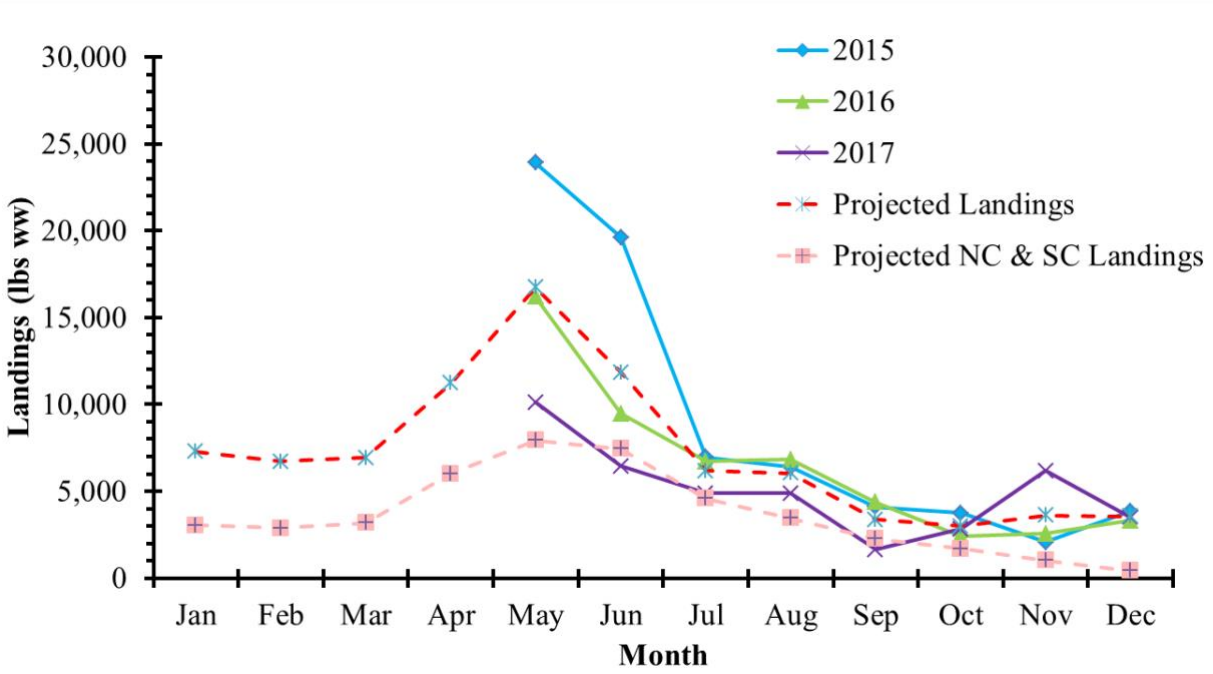

Figure H-3. South Atlantic red grouper commercial landings (lb ww) by month for 2015-2017. Landings for the months of Jan-Apr were removed since these months are closed to all shallow-water grouper through Amendment 16 (SAFMC 2009), and therefore future landings are assumed to be either zero or negligible.
To produce Projected Landings (all states) and Projected NC and SC Landings for May through December, average landings from 2015-2017 are used. Projected January through April landings (for all states and North Carolina and South Carolina) were estimated using May landings, and the ratio was determined from historic landings from 2007-2009. No predictions were made for Florida and Georgia in January through April because none of the alternatives of Action 3 propose opening the red grouper fishery during this period in these states.

The ACLs implemented under Abbreviated Framework 1 are 61,160 lbs ww for 2018, 66,000 lbs ww for 2019, and 71,280 lbs ww for 2020 and later years. In recent years, the commercial landings have declined each year (**Table H-5, Figure H-3**), with 40,490 lbs ww being landed in 2017, which was well below the 2017 ACL of 343,200 lbs ww, or any of the revised commercial ACLs implemented under Abbreviated Framework 1. North Carolina and South Carolina made up 51% of the South Atlantic red grouper average landings. If the South Atlantic Council decides to modify the seasonal prohibition on commercial harvest, possession, sale and purchase of red grouper in the EEZ off South Carolina and North Carolina, then the total South Atlantic landings of red grouper will be affected, and may impact whether the ACLs implemented under Abbreviated Framework 1 are reached. All Action 3 alternatives being considered in this amendment, including Alternative 1 (No Action), would result in no seasonal closures, because projected landings are below the ACLs (**Table H-6; Figure H-4**).

Table H-6. Projected South Atlantic red grouper commercial landings for each Action 3 Alternative. Landings were estimated from the average 2015-2017 commercial landings. Preferred alternatives are indicated in bold.

Action 3 Alternatives	Projected Landings (lb ww)
Alternative 1 (No Action)	54,339
Sub-Alternative 2a	**46,404**
Sub-Alternative 2b	49,451

Sub-Alternative 2c	44,992

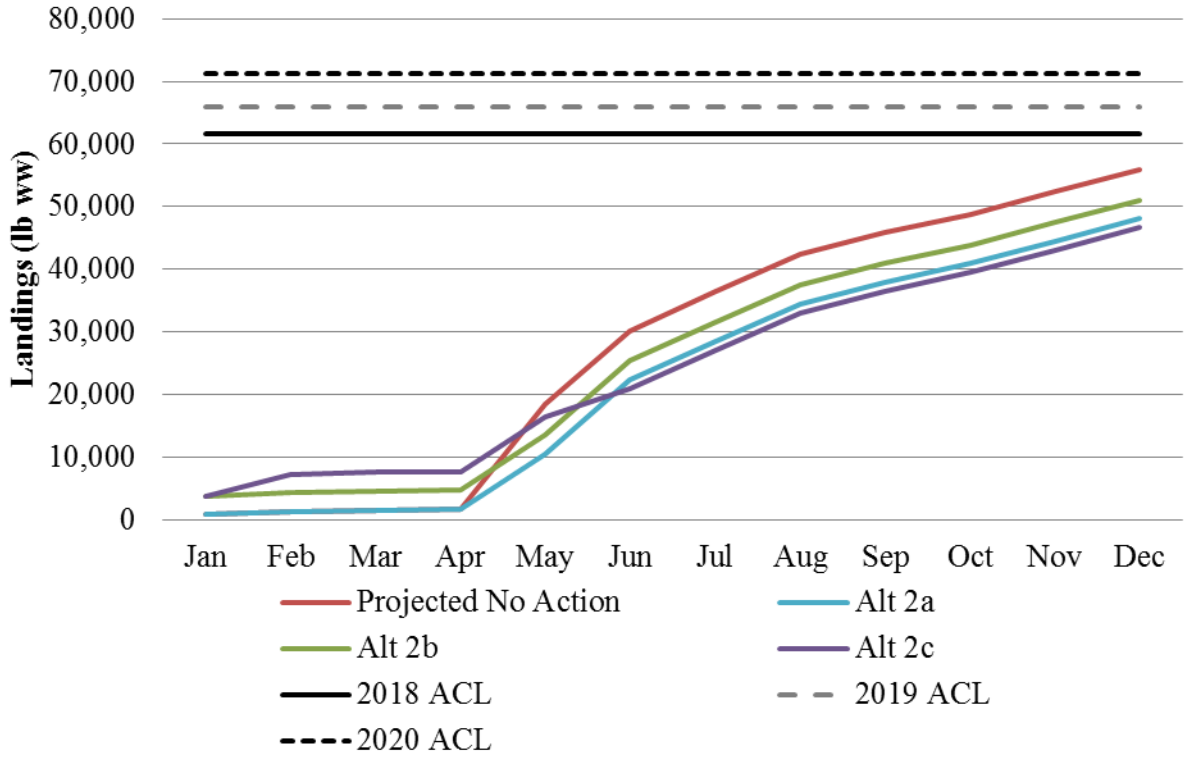

Figure H-4. Predicted South Atlantic red grouper commercial landings (lbs ww) by month with the commercial ACLs stated in the Abbreviated Framework 1 to predict South Atlantic red grouper commercial closure dates.

1.2.2 Action 4: Commercial Trip Limit Analysis

Regulatory Amendment 30 proposes a commercial trip limit for red grouper harvested in the South Atlantic EEZ. **Table H-7** provides the trip limit alternatives proposed in Action 4.

Table H-7. South Atlantic red grouper commercial trip limit alternatives stated in Action 4 of Regulatory Amendment 30.

Action 4 Alternatives:	**Trip Limit:**
Alternative 1 (No Action)	No commercial trip limit
Sub-Alternative 2a	75 lbs gw
Sub-Alternative 2b	100 lbs gw
Sub-Alternative 2c	150 lbs gw
Sub-Alternative 2d	200 lbs gw

Landings data for South Atlantic red grouper by trip level were obtained from the Southeast SEFSC commercial logbook datasets (6/31/2018). Future landings were determined from taking a three-year average of the three most recent years (2015-2017) of complete data, as the most recent data are believed to be the best approximation of future landings. Between 2015 and 2017, a total of 2,447 commercial trips harvested at least one pound of red grouper, and 77% of those commercial trips landed 75 lb gw or less of red grouper. Therefore, only 23% of the commercial trips will be affected by this action **(Figure**

H-5). If the South Atlantic Council decides to apply a commercial trip limit for the red grouper fishery, then the total South Atlantic landings of red grouper will be reduced between 11 and 37% (**Table H-8)**. As a result, no in-season closures for commercial South Atlantic red grouper were projected for the 2018, 2019 and 2020 proposed ACLs for each of the five proposed commercial trip limit alternatives.

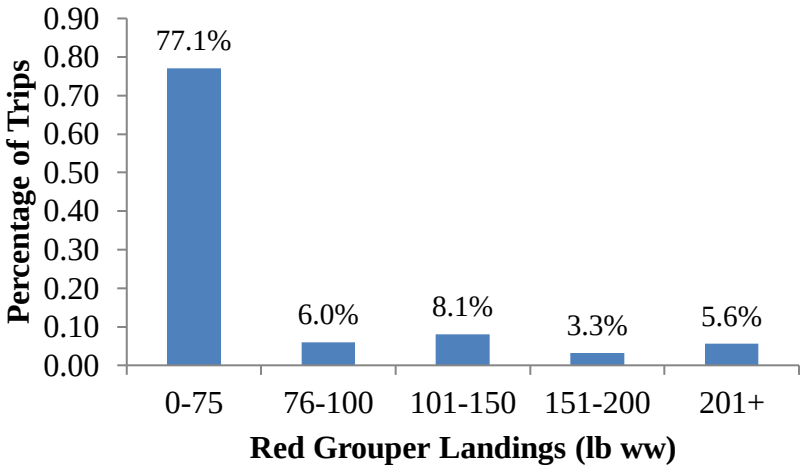

Figure H-5. Distribution of South Atlantic red grouper commercial trips within each landing bin. Predicted commercial landings came from the average 2015-2017 commercial landings.

Table H-8. Projected South Atlantic red grouper commercial landings for each Action 4 Alternatives. Landings were estimated from the average 2015-2017 commercial landings. Note: Alternatives do not assume Action 3 alternatives are included.

Action 4 Alternatives:	Predicted Landings (lb ww)	Percent Reduction from Alternative 1 (No Action)
Alternative 1 (No Action) (No Action 3 alternatives + No trip limit)	54,339	0%
Sub-Alternative 2a (No Action 3 alternatives + 75 lbs gw trip limit)	34,302	36.9%
Sub-Alternative 2b (No Action 3 alternatives + 100 lbs gw trip limit)	38,989	28.3%
Sub-Alternative 2c (No Action 3 alternatives + 150 lbs gw trip limit)	44,782	17.6%
Sub-Alternative 2d (No Action 3 alternatives + 200 lbs gw trip limit)	48,102	11.5%

1.2.3 Actions 3 and 4 combined: Commercial Seasonal Prohibition and Commercial Trip Analysis

If the South Atlantic Council decides to implement the Action 3 **Preferred Sub-Alternative 2a** (Jan – Apr season prohibition in FL and GA and a Jan – May season prohibition in NC and SC) in conjunction

with the Action 4 trip limit alternatives, then the landings of South Atlantic commercial red grouper will be further reduced (**Table H-9)**. Both actions together result in total landings that are further reduced to 46,404 lb ww with no trip limit, and continue to decline with Action 4 alternatives 2a-2d(**Table H-9)**. As a result, no in-season closures for commercial South Atlantic red grouper were projected for the 2018, 2019 and 2020 proposed ACLs for each of the five proposed commercial trip limit alternatives because none of the ACLs were predicted to be met or exceeded.

Table H-9. Projected South Atlantic red grouper commercial landings combined with a January through May closed season for North Carolina and South Carolina (Action 3, preferred Sub-Alternative 2a) for each Action 4 Alternative. Landings were estimated from the average 2015-2017 commercial landings.

Action 4 Alternatives:	Predicted Landings (lb ww)	Percent Reduction from Alternative 1 (No Action)
Alternative 1 (No Action) (Action 3 preferred + No trip limit)	46,404	0%
Sub-Alternative 2a (Action 3 preferred + 75 lbs gw trip limit)	29,491	36.4%
Sub-Alternative 2b (Action 3 preferred + 100 lbs gw trip limit)	33,461	27.9%
Sub-Alternative 2c (Action 3 preferred + 150 lbs gw trip limit)	38,341	17.4%
Sub-Alternative 2d (Action 3 preferred + 200 lbs gw trip limit)	41,099	11.4%

The reliability of these results is dependent upon the accuracy of the underlying data and input assumptions. We have attempted to create a realistic baseline as a foundation for comparisons, under the assumption that projected future landings will accurately reflect actual future landings. These closure dates are a best estimate, but uncertainty still exists as economic conditions, weather events, changes in catch-per-unit effort, fisher response to management regulations, and a variety of other factors may cause departures from any assumption.

References:

SEDAR. 2017. SEDAR 53 – South Atlantic Red Grouper Assessment Report. SEDAR, North Charleston SC. 159 pp. available online at: http://sedarweb.org/sedar-53.

Appendix I. Bycatch Practicability Analysis

Background

The Magnuson-Stevens Act at §3(2) defines bycatch as "fish which are not harvested in a fishery, but which are not sold or kept for personal use, and includes economic discards and regulatory discards. Such term does not include fish released alive under a recreational catch-and-release fishery management program." Economic discards are fish that are discarded because they are undesirable to the harvester. Economic discards generally includes certain species, sizes, and/or sexes with low or no market value.

Regulatory discards are fish that are required by regulation to be discarded, but also include fish that may be retained but not sold. National Marine Fisheries Service (NMFS) outlines at 50 CFR §600.350(d)(3)(i) ten factors that should be considered in determining whether a management measure minimizes bycatch or bycatch mortality to the extent practicable.

1. Population effects for the bycatch species.
2. Ecological effects due to changes in the bycatch of that species (effects on other species in the ecosystem).
3. Changes in the bycatch of other species of fish and the resulting population and ecosystem effects.
4. Effects on marine mammals and birds.
5. Changes in fishing, processing, disposal, and marketing costs.
6. Changes in fishing practices and behavior of fishermen.
7. Changes in research, administration, and enforcement costs and management effectiveness.
8. Changes in the economic, social, or cultural value of fishing activities and non-consumptive uses of fishery resources.
9. Changes in the distribution of benefits and costs.
10. Social effects.

The Fishery Management Councils are encouraged to adhere to the precautionary approach outlined in Article 6.5 of the Food and Agriculture Organization of the United Nations Code of Conduct for Responsible Fisheries when uncertain about these factors.

The South Atlantic Fishery Management Council (Council) manages Snapper Grouper stocks in federal waters from the Florida Keys to the Virginia/North Carolina border. In Vision Blueprint Commercial Regulatory Amendment 27 (Regulatory Amendment 27) to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP), the Council has proposed modifications of commercial regulations such as fishing seasons, trip limits, seasonal closures, and size limits for species in the Snapper Grouper FMP. These proposed management measures are intended to address commercial stakeholder input to enable equitable access for fishermen participating in the Snapper Grouper FMP, and to minimize discards. In the South Atlantic, most snapper grouper species are harvested with hook-and-line gear. Many of the species under consideration in Regulatory

Amendment 27 are indirectly harvested during trips targeting other stocks; for this reason, uncertainty in the historical data is often high.

1.1 Population Effects for the Bycatch Species

A total of 22 species could be directly impacted by actions included in Regulatory Amendment 27. **Table D-1** lists the species most often landed on the same trip in the South Atlantic using Southeast Fisheries Science Center (SEFSC) commercial logbook data. The analysis was done by isolating all commercial logbook trips that reported at least one pound landed for the species of interest using data from 2014 through 2016 in the South Atlantic. Next, on the same trips, the numbers of trips in which other species were also landed were used to provide a percentage of trip co-occurrence. Two of the 22 species did not have enough trip data available (< 25 trips) for meaningful analyses (coney and yellowmouth grouper). Some species had other species landed on greater than 70% of the trips; most notably, red porgy on trips landing scamp, scamp with rock hind, and vermilion snapper on trips landing gray triggerfish. Additionally, blueline tilefish and snowy grouper had high co-occurrence with each other and due to the high release mortality associated with their capture depths (95 and 100%, respectively), efforts should be made to align any seasonal or quota closures to avoid regulatory discarding. The most common species being landed with greater amberjack was gag on 29.5% of the trips. Species of interest with no dominant co-occurring species may be due to the ability of fishers to selectively target the species of interest using specific gear, locations, seasonal patterns, or a combination of these thus avoiding unnecessary bycatch. It is not possible to do a meaningful analysis of any long-term population effects due to changes in effort based on the high connectivity between many of the species being landed in the fishery; however, efforts to align any seasonal or quota closures between species with high co-occurrence should be beneficial. These analyses are limited to co-occurrence of landings and do not contain any information on species that were discarded at-sea. Other studies have incorporated data from the Reef Fish Observer Program in the Gulf of Mexico and an independent sampling program that may provide more comprehensive analyses, but these are focused on the Gulf of Mexico and not the South Atlantic (Farmer et al. 2016; Pulver et al. 2016).

Table D-1. The species of interest, the number of trips where at least one pound was landed for the species of interest, and the top three species caught on the same trips in the South Atlantic for all gear types from 2014 through 2016, including the percentage of trip co-occurrence for species one through three.

Species of Interest	Number of Trips	Species One	Species Two	Species Three
Almaco Jack	3,397	Vermilion Snapper (54.1%)	Gray Triggerfish (47.8%)	Greater Amberjack (42.1%)
Banded Rudderfish	1,201	Almaco Jack (49.5%)	Greater Amberjack (38.4%)	Vermilion Snapper (31.6%)
Black Grouper	2,853	Mutton Snapper (41.1%)	Yellowtail Snapper (36.8%)	Red Grouper (29.6%)
Blackfin Snapper	151	Dolphin (34.4%)	Scamp (34.4%)	Red Porgy (33.8%)
Blueline Tilefish	1,778	Snowy Grouper (62.5%)	Golden Tilefish (23.5%)	Vermilion Snapper (23.5%)
Gag	4,986	Black Sea Bass (49.4%)	Red Porgy (42%)	Scamp (40.5%)
Gray Triggerfish	4,168	Vermilion Snapper (72.5%)	Black Sea Bass (42.9%)	Almaco Jack (38.9%)
Graysby	55	Gray Snapper (54.5%)	Gag (41.8%)	Sheepshead (41.8%)
Greater Amberjack	6,778	Gag (29.5%)	Red Porgy (26.5%)	Vermilion Snapper (25.9%)
Lesser Amberjack	308	Vermilion Snapper (32.1%)	Gray Triggerfish (29.2%)	Black Sea Bass (26.9%)
Queen Snapper	60	Snowy Grouper (43.3%)	Greater Amberjack (38.3%)	Blueline Tilefish (26.7%)
Red Grouper	2,921	Red Porgy (41.7%)	Scamp (40.6%)	Gag (40.5%)
Red Hind	599	Red Porgy (77.6%)	Scamp (75.1%)	Gag (53.3%)
Red Porgy	4,109	Scamp (57.2%)	Black Sea Bass (56.5%)	Gag (51%)
Rock Hind	1,066	Scamp (81.4%)	Red Porgy (77.9%)	Gag (72.7%)
Scamp	3,138	Red Porgy (75.0%)	Gag (64.4%)	Greater Amberjack (53.3%)
Silk Snapper	729	Vermilion Snapper (54.9%)	Red Porgy (49.1%)	Gray Triggerfish (46.8%)
Snowy Grouper	3,582	Blueline Tilefish (31.0%)	Golden Tilefish (28.2%)	Almaco Jack (24.7%)
Vermilion Snapper	5,252	Gray Triggerfish (57.5%)	Black Sea Bass (43.3%)	Red Porgy (39.3%)
Yellowfin Grouper	69	Red Grouper (73.9%)	Scamp (73.9%)	Gag (71.0%)

Source: Southeast Fisheries Science Center Commercial Logbook (November 2017). Note: Two species caught on few trips (< 25) were not included as a species of interest.

Current Discards

Currently, commercial discard data are collected using a supplemental form that is sent to a 20% stratified random sample of the active permit holders in the snapper grouper fishery. However, in the absence of any observer data, there are concerns about the accuracy of logbook data in collecting bycatch information. Biases associated with logbooks primarily result from inaccuracy in reporting of species that are caught in large numbers or are of little economic interest (particularly of bycatch species), and from low compliance rates. Commercial discards were estimated by month using the SEFSC Commercial Logbook and Supplemental Discard Logbook (accessed May 2017) to develop a discard rate in numbers of fish per unit of effort, by species, gear, and region, and expand that rate to the total effort in the fishery by gear and region. Note that a randomly selected comprehensive observer program is not available in the South Atlantic, thus estimation of commercial discards is reliant upon self-reported data.

From 2014 through 2016, the commercial sector of the South Atlantic snapper grouper fishery had on average less than 1,000 discards reported annually for the majority of species potentially affected in Regulatory Amendment 27 (**Table D-2**). It is difficult to compare the ratio of commercial landings to discards because commercial landings are reported in pounds whole weight (lbs ww) and discards are reported in numbers of fish (N). However based on the information available, red porgy had high numbers of discards (24,754) relative to landings, compared to other species. On the contrary, greater amberjack had on average only 3,630 fish being reported discarded annually with the second highest average annual landings (857,415 lbs ww). Greater amberjack discard data in conjunction with the trip co-occurrence analyses indicates fishers are likely able to selectively harvest greater amberjack. Vermilion snapper, red porgy, and gray triggerfish had the highest number of discards reported on average annually. Vermilion snapper, red porgy, and gray triggerfish also co-occurred on a high percentage of trips, and the high number of discards for these species may be due to inability of fishers to selectively target one of the species during a seasonal or quota closure for a co-occurring species, e.g., targeting vermilion snapper when red porgy is closed.

In addition to the number of self-reported discards per trip and gear, the SEFSC Supplemental Discard Logbook attempts to quantify the reason why discarding occurs using four codes.

1) Regulation – Not legal size: Animals that would have been sold, however local or federal size limits forbid it.
2) Regulation – Out of season: Animals that would have been sold, however the local or federal fishing season is closed.
3) Regulation – Other: Animals that would have been sold, however a local or federal regulation other than size or season, forbids it (Other than size or season; i.e., protected species, not properly permitted).
4) Market conditions: Animals that have no market value (rotten, damaged).

Fishers can specify multiple reasons for a species discarded on the same trip and gear. More information on the discard logbook is available here https://www.sefsc.noaa.gov/fisheries/logbook.htm.

The discard logbook only contains self-reported discards from a 20% sub-sample by region and gear fished; thus, it may not be representative of the entire fishery. Of the four codes described above,

regulations (i.e., not legal size or out of season) were the most common reason selected, depending on the species, based on the number of self-reported discards (**Table D-3**). For the three species that had the highest number of discards reported on average annually (vermilion snapper, red porgy, and gray triggerfish), 'out of season' was the most common reason selected. Efforts to align any seasonal or quota closures among these three species would likely be beneficial in reducing discards. The regulation 'not legal size' was the most common reason selected for black grouper, gag, greater amberjack, and scamp. For species with a low estimated release mortality rate, such as greater amberjack and almaco jack, a high percentage of released fish likely survive resulting in minimal long-term population effects from a minimum size limit. Even for other species with higher release mortality rates, a minimum size limit could potentially benefit the stock by increasing spawning potential (larger fish are more fecund) and therefore remains an effective management measure to achieve reductions in harvest to keep landings below the annual catch limit (ACL).

Table D-2. Mean annual South Atlantic commercial landings and estimates of discards for species from 2014 through 2016. Mean commercial landings are in pounds (lbs) whole weight (ww). Discards represent numbers of fish (N).

Species	Mean Landings (lbs ww)	Mean Discards (N)
Almaco Jack	147,370	3,091
Banded Rudderfish	55,502	400
Black Grouper	82,906	1,699
Blackfin Snapper	456	0
Blueline Tilefish	110,824	5,106
Coney	127	0
Gag	331,809	8,127
Gray Triggerfish	285,310	17,516
Graysby	648	24
Greater Amberjack	857,415	3,630
Lesser Amberjack	6,026	86
Queen Snapper	1,639	0
Red Grouper	96,752	902
Red Hind	4,040	4
Red Porgy	140,569	24,754
Rock Hind	7,260	4
Scamp	144,823	1,164
Silk Snapper	11,444	4
Snowy Grouper	148,504	351
Vermilion Snapper	865,546	27,222
Yellowfin Grouper	1,485	0
Yellowmouth Grouper	182	0

Sources: Commercial landings data from SEFSC Commercial ACL Dataset (October 2017) with discard estimates expanded from the SEFSC Supplemental Commercial Discard Logbook (May 2017). The number of trips from 2014 through 2016 is available in Table D-1.

Table D-3. The number of trips with discards reported to the Supplemental Discard Logbook in the South Atlantic from 2014 through 2016 and percentage of unexpanded discards for each discard reason out of the total number of self-reported discards.

Species	Number of Trips	Not Legal Size	Out of Season	Other Regulations	Market Conditions
Almaco Jack	378	3.0%	80.4%	3.7%	13.0%
Black Grouper	190	60.1%	27.5%	9.4%	3.1%
Blueline Tilefish	116	0.4%	84.9%	14.7%	0.0%
Gag	639	74.3%	23.5%	0.8%	1.5%
Gray Triggerfish	445	28.6%	64.7%	6.3%	0.3%
Greater Amberjack	469	84.5%	10.4%	3.7%	1.4%
Red Porgy	1,197	19.7%	77.1%	3.2%	0.1%
Scamp	485	57.7%	40.1%	1.9%	0.3%
Vermilion Snapper	1,292	32.2%	60.7%	6.7%	0.4%

Sources: SEFSC Supplemental Commercial Discard Logbook (November 2017). Note the logbook only contains self-reported discards from a 20% sub-sample by region and gear fished thus may not be representative of the entire fishery. The analysis was limited to species with greater than 1,000 expanded discards reported on average annually from table D-2.

Release Mortality Rates

A wide range of release mortality rates are expected to occur based on the diversity of species potentially affected in Regulatory Amendment 27. Generally, release mortality is highly correlated with depth for snapper grouper species, with highest mortality among fish captured in deep water (Campbell et al. 2014; Pulver 2017; Rudershausen et al. 2014; Stephen and Harris 2010; Wilson and Burns 1996). Many species can be captured over a broad depth range or transition to different depth zones throughout their life history, so release mortality rates can be highly variable. Recent Southeast Data, Assessment, and Review (SEDAR) assessments include estimates of release mortality rates based on published study and industry input. Stock assessment reports can be found at http://sedarweb.org/.

SEDAR 50 (2017) estimated a point release mortality rate of 95% (sensitivity range: 90-100%) for blueline tilefish captured in the South Atlantic hook-and-line commercial fishery. Snowy grouper also had a high release mortality rate of 100% estimated in SEDAR 36 (2014). A lower release mortality rate of 20% (sensitivity range: 10-30%) was estimated for greater amberjack in the South Atlantic (SEDAR 15 2008). SEDAR 59 is currently underway for South Atlantic greater amberjack and could potentially update the greater amberjack release mortality estimate. SEDAR 01 Update (2012) recommended a base release mortality rate for red porgy of 35% based on the previous SEDAR, but also discussed a higher rate of 82% s reported by Stephen and Harris (2010) may be more appropriate. The SEDAR 01 Update assessment (2012) determined if the higher release mortality rate of 82% is correct, overfishing may have occurred during multiple years in the previous decade. SEDAR 17 Update (2012) estimated a release mortality rate of 41% (sensitivity range: 24-53%) for vermilion snapper captured by the commercial sector in the South Atlantic. SEDAR 55 is currently underway for vermilion snapper and could potentially update the vermilion snapper mortality rate estimate.

A very low discard mortality rate (sensitivity range: 0-10%) was recommended in SEDAR 49 (2016) for almaco jack. Fishers cited the shallower depth of capture and the general hardiness of almaco jacks compare to greater amberjack as support for the very low release mortality rate. In the same assessment, a low release mortality estimate between 20 and 40% was recommended for lesser amberjack. No SEDAR estimate of banded rudderfish release mortality is currently available, but based on similar physiology to other species within the same genus (almaco jack, greater amberjack, and banded rudderfish) a range of between 0 and 40% could be expected. A South Atlantic red grouper commercial release mortality base estimate of 20% (sensitivity range: 10-30%) was recommended in SEDAR 53 (2017). It was noted after the assessment that 20% might be too low an estimate for red grouper based on other research and the most recent assessment in the Gulf of Mexico (Pulver 2017; SEDAR 42 2015). No SEDAR estimate of release mortality were available for queen snapper, silk snapper, or blackfin snapper, but due to the relatively deep depth of capture for these species release mortality is likely very high (near 100%). SEDAR 41 (2016) estimated a low release mortality rate of 12.5% (sensitivity range: 5-20%) for gray triggerfish in the South Atlantic.

Expected Impacts on Bycatch for the Proposed Actions

Action 1 would establish a commercial split season and modify the commercial trip limit for blueline tilefish. On average, 5,106 blueline tilefish were discarded annually according to the SEFSC discard logbook from 2014 through 2016, with 'out of season' selected as the primary reason for discarding. Reducing the trip limit could extend the fishing season longer and reduce regulatory discarding when fishers are targeting other species, but still catching blueline tilefish after the commercial blueline tilefish fishery has closed. However, the commercial trip limit could also increase discarding if the amount is overly restrictive and fishers catch more blueline tilefish than the trip limit. Bycatch and discards could increase, decrease, or remain the same by establishing a commercial split season. If the commercial split season is better aligned with the fishing seasons of other deep-water species, primarily snowy grouper, discards would remain similar or decrease, but if the fishing seasons are not aligned regulatory discarding could increase.

Action 2 would establish a commercial split season for snowy grouper. Currently, very few discards relative to the landings are being reported. Similar to blueline tilefish, if the commercial split season coincides with other deep-water species, discards would remain similar or decrease, but if the fishing seasons are not aligned regulatory discarding could potentially increase.

Action 3 would establish a commercial split season and modify the commercial trip limit for greater amberjack. The commercial split season and trip limit should lengthen the fishing season which has closed early when the ACL has been met the past few years. Currently, relatively few discards are reported for greater amberjack and any changes in discards would likely have minimal population effects because greater amberjack have a low discard mortality rate.

Action 4 would establish a commercial split season and modify the commercial trip limit for red porgy. The commercial split season and trip limit should lengthen the fishing season, reducing discards when other species are targeted, primarily gray triggerfish and vermilion snapper. Reducing the trip limit could also increase discards if the amount is overly restrictive and fishers catch more red porgy than the

trip limit. Red porgy have a moderate estimated release mortality rate so some negative population effects would be expected from an increase in discards.

Action 5 would modify the commercial trip limit for vermilion snapper and could lengthen the fishing season, reducing discards when other species are targeted, primarily gray triggerfish and red porgy. Reducing the trip limit could also increase discards if the amount is overly restrictive and fishers catch more vermilion snapper than the trip limit. Vermilion snapper have a moderate estimated release mortality rate so some negative population effects would be expected from an increase in discards.

Action 6 would implement a minimum size limit for almaco jack for the commercial sector. Almaco jack have a very low estimated release mortality rate (0-10%). A high percentage of released fish likely survive resulting in minimal long-term population effects. The minimum size limit may benefit the stock by increasing spawning potential and remains an effective management measure to achieve reductions in harvest to extend the length of the fishing season.

Action 7 would implement a commercial trip limit for the Other Jacks Complex. Similar to other actions, reducing the trip limit could extend the fishing season longer and reduce any regulatory discarding when targeting other species during periods when the fishery has typically been closed. However, the commercial trip limit could also increase discards if the amount is overly restrictive and fishers catch more jacks than the trip limit. The species in the Other Jacks Complex (almaco jack, lesser amberjack, and banded rudderfish) have low estimated release mortality rates, so any increases in discards are expected to have minimal population effects.

Action 8 would modify the seasonal prohibition on commercial harvest and possession of red grouper in the Exclusive Economic Zone off South Carolina and North Carolina. Stricter management measures would increase discards in the Exclusive Economic Zone off South Carolina and North Carolina, but would likely have a positive population effect by protecting the stock during peak spawning periods. Future efforts could concentrate on reducing release mortality during the seasonal closure such as the use of descending devices. The only other measure to further reducing discards during the seasonal closure would be to limit effort or change the selectivity of fishing gear in such a way as to reduce the capture of red grouper.

Action 9 would remove the commercial minimum size limit for queen snapper, silk snapper, and blackfin snapper. Eliminating the minimum size limit should reduce discards, but very few self-reported commercial discards have been reported recently. No change in population effects is expected because any fish that were previously released were likely discarded dead due to the depth of capture typically associated with these three species.

Action 10 would reduce the commercial minimum size limit for gray triggerfish in the Exclusive Economic Zone off east Florida. Reducing the minimum size limit should reduce discards when the fishery is open, but the increase in harvest could shorten the fishing season and increase discards due to an earlier closure. Any benefit from reduced discarding when the fishery is open may be minimal because of the low (12.5%) estimated release mortality rate, e.g., the most of the undersized gray triggerfish likely survived. Further the stock may be negatively affected by harvesting gray triggerfish at an earlier age, potentially reducing spawning potential.

Past, Current, and Future Actions to Prevent Bycatch and Improve Monitoring of Harvest, Discards, and Discard Mortality

The Comprehensive Ecosystem-Based Amendment 2 (CE-BA 2; SAFMC 2011b) included actions that removed harvest of octocorals off Florida from the Coral, Coral Reefs, and Live/Hard Bottom Habitat Fishery Management Plan (Coral FMP); set the octocoral ACL for Georgia, South Carolina, and North Carolina equal to 0; modified management of special management zones (SMZs) off South Carolina; revised sea turtle release gear requirements for the snapper grouper fishery that were established in Amendment 15B to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP; SAFMC 2008); and designated new essential fish habitat (EFH) and EFH-Habitat Areas of Particular Concern in the South Atlantic. There is no bycatch associated with octocoral harvest within the management area of the Coral FMP since harvest is prohibited. CE-BA 2 also included an action that limited harvest and possession of snapper grouper and coastal migratory pelagics (CMP) species to the bag limit in SMZs off South Carolina. This action likely reduced bycatch around SMZs by restricting commercial harvest in the area, but has probably had limited effect on the magnitude of overall bycatch of snapper grouper species in the South Atlantic.

Other actions have been taken in recently implemented amendments that have reduced bycatch of and bycatch mortality of federally managed species in the South Atlantic. Amendment 13C to Snapper Grouper FMP (SAFMC 2006) required the use of 2 inch mesh in the back panel of black sea bass pots, which has likely reduced the magnitude of regulatory discards. Amendment 16 to the Snapper Grouper FMP (SAFMC 2009) required the use of dehooking devices, which could help reduce bycatch mortality of vermilion snapper, black sea bass, gag, red grouper, black grouper, and red snapper. Dehooking devices can allow fishermen to remove hooks with greater ease and more quickly from snapper grouper species without removing the fish from the water. If a fish does need to be removed from the water, dehookers reduce handling time thus increasing survival (Cooke et al. 2001). Furthermore, Amendment 17A to the Snapper Grouper FMP (SAFMC 2010a) required circle hooks for snapper grouper species north of 28 degrees latitude, which has likely reduced bycatch mortality of some snapper grouper species. Amendment 17B to the Snapper Grouper FMP (SAFMC 2010b) established ACLs and AMs and address overfishing for eight species in the snapper grouper management complex: golden tilefish, snowy grouper, speckled hind, warsaw grouper, black sea bass, gag, red grouper, black grouper, and vermilion snapper. Overfishing is no longer occurring for black sea bass, snowy grouper, red grouper, black grouper, and vermilion snapper.

The Comprehensive ACL Amendment (SAFMC 2011a) implemented ACLs and AMs for species not undergoing overfishing in the Fishery Management Plans for snapper grouper, dolphin and wahoo, golden crab and *Sargassum*, in addition to other actions such as allocations and establishing annual catch targets for the recreational sector. The Comprehensive ACL Amendment (SAFMC 2011a) also established additional measures to reduce bycatch in the snapper grouper fishery with the establishment of species complexes based on biological, geographic, economic, taxonomic, technical, social, and ecological factors. ACLs were assigned to these species complexes, and when the ACL for the complex is met or projected to be met, fishing for species included in the entire species complex is prohibited for the fishing year. ACLs and AMs will likely reduce bycatch of target species and species complexes as well as incidentally caught species.

Amendment 18A to the Snapper Grouper FMP (SAFMC 2011c), included actions that could reduce bycatch of black sea bass and the potential for interactions with protected species. Actions in Amendment 18A limited the number of participants in the black sea bass pot sector, required fishermen bring pots back to port at the completion of a trip, and limited the number of pots a fishermen can deploy. Amendment 24 to the Snapper Grouper FMP (SAFMC 2011d) established a rebuilding plan for red grouper, which was overfished and undergoing overfishing. Amendment 24 (SAFMC 2011d) also established ACLs and AMs for red grouper, to help to reduce bycatch of red grouper and co-occurring species.

The final rule (78 FR 23858; April 23, 2013) for Amendment 18B to the Snapper Grouper FMP (SAFMC 2012), established an endorsement program for the commercial golden tilefish longline sector, which could have positive effects for habitat and protected species. Regulatory Amendment 14 to the Snapper Grouper FMP (SAFMC, 2014) adjusted management measures for a number of snapper grouper species, some of which likely reduced the magnitude of discards. Regulatory Amendment 15 to the Snapper Grouper FMP included actions for yellowtail snapper and gag that are expected to reduce bycatch of snapper grouper species (SAFMC, 2013a). Amendment 36 to the Snapper Grouper FMP established Spawning Special Management Zones (SMZs), and is expected to reduce bycatch of many snapper grouper species, especially speckled hind and warsaw grouper.

The Joint Dealer Reporting Amendment (SAFMC 2013b), which went into effect on January 27, 2014, has changed the reporting frequency for landings by headboats from monthly to weekly, and requires that reports be submitted electronically. The action is expected to provide more timely information on landings and discards. Improved information on landings would help ensure ACLs are not exceeded. Furthermore, more timely and accurate information would be expected to provide a better understanding of the composition and magnitude of catch and bycatch, enhance the quality of data provided for stock assessments, increase the quality of assessment output, and lead to better decisions regarding additional measures to reduce bycatch. Management measures that affect gear and effort for a target species can influence fishing mortality in other species. Therefore, enhanced catch and bycatch monitoring would provide better data that could be used in multi-species assessments.

The Council is developing Amendment 39 to the Snapper Grouper FMP, Amendment 9 to the Dolphin Wahoo FMP and Amendment 27 to the Coastal Migratory Pelagics FMP of the Gulf of Mexico and Atlantic Regions that proposes mandatory weekly electronic reporting for charter vessel operators with a federal for-hire permit in the snapper grouper, dolphin wahoo, or coastal migratory pelagic fisheries; reduces the time allowed for headboat operators to complete their electronic reports; and proposes requiring location reporting by charter vessels with the same detail now required for headboat vessels. The notice of availability published on March 14, 2018 (83 FR 11164), and the comment period ends on May 13, 2018. The proposed rule published on April 4, 2018 (83 FR 14400), and the comment period ends on May 4, 2018.

Other amendments under development to the Snapper Grouper FMP include Amendment 42, which will include actions to include sea turtle release gear in the regulations for the commercial snapper grouper fishery and consider modifications to the snapper grouper framework so the Council may more quickly modify sea turtle and other protected resources release gear and handling requirements in the future. The Council approved the amendment for scoping at their March 2018 meeting

Amendment 46 to the Snapper Grouper FMP is being developed to focus on private recreational permit and reporting (e.g., MyFishCount App).

Amendment 47 to the Snapper Grouper FMP may be developed to explore a moratorium on the for-hire component of the snapper grouper fishery. In March 2018, the Council provided detailed input and directed staff to develop a draft scoping document based on their direction to consider at the June 2018 meeting.

Vison Blueprint Recreational Regulatory Amendment 26 to the Snapper Grouper FMP proposes to modify recreational regulations for species in the snapper grouper complex, including aggregate bag limits, seasonal closures, minimum size limits, and gear requirements for certain species. The purpose of this amendment is to address recreational stakeholder input to increase access and predictability for the recreational component of the snapper grouper fishery, minimize regulatory discards, and improve regulatory compliance and consistency.

The Council will review options at their June 2018 for Regulatory Amendment 29 to the Snapper Grouper FMP, which will contain actions pertaining to best fishing practices (e.g., descending devices) and powerhead regulations.

Regulatory Amendment 31 to the Snapper Grouper FMP (included in the Comprehensive Recreational Accountability Measures Amendment) could include actions to revise recreational accountability measures to allow more flexibility in managing recreational fisheries

The Bycatch Reporting Amendment considers improvements in bycatch/discard data collection methods to better quantify all sources of fishing mortality in South Atlantic fisheries. Alternatives consider expanding aspects of the Atlantic Coastal Cooperative Statistics Program's Release, Discard and Protected Species Module to coastal migratory pelagic (SA Council area only) and dolphin and wahoo fisheries; and also implementing a commercial observer program at 2-5% coverage levels for snapper grouper, coastal migratory pelagic (SA Council area only), dolphin and wahoo, and golden crab vessels. Based on discussions at the September 2014 Council meeting, the SEFSC/SERO agreed to draft a comprehensive bycatch reporting system for the southeast. The SEFSC and SERO provide an update on their efforts at each Council meeting. The Council's intent is that the bycatch reporting system would be specified and implemented though this amendment. The Council has postponed development until after NMFS publishes the rule for the Standard Bycatch Reporting Methodology.

These future actions will help to improve estimates on the composition and magnitude of catch and bycatch of snapper grouper species, as well as all other federally managed species in the southeast region. Additional information on fishery related actions from the past, present, and future considerations can be found in **Chapter 6** (Cumulative effects) of the environmental assessment.

1.2 Ecological Effects Due to Changes in Bycatch of that Species (effects on other species in the ecosystem).

The ecological effects of bycatch mortality are the same as fishing mortality from directed fishing efforts. If not properly managed and accounted for, either form of mortality could potentially reduce stock biomass to an unsustainable level. Relationships among species in marine ecosystems are complex and poorly understood, making the nature and magnitude of ecological effects difficult to predict. As mentioned in the above section, actions have been taken, and are underway to reduce bycatch and enhance data reporting for snapper grouper species. Better bycatch and discard data would provide a better understanding of the composition and magnitude of catch and bycatch, enhance the quality of data provided for stock assessments, increase the quality of assessment output, and lead to better decisions regarding additional measures to reduce bycatch.

As summarized in **Section 1.1** of this BPA, most actions in Regulatory Amendment 27 are not expected to result in significant changes in bycatch for most of the actions. Additionally, as stated in **Chapter 3,** and analyzed in detail in **Chapter 4**, the biological (and consequently ecological) effects due to changes in the bycatch would likely be negligible for the species with low release mortality rates, but potentially much greater for species with higher mortality rates.

1.3 Changes in the Bycatch of Other Fish Species and Resulting Population and Ecosystem Effects

Regulatory Amendment 27 is not expected to affect major changes in bycatch of other fish species. Bycatch of other species is incidental in the hook-and-line fishery for most of the species. Furthermore, improved data monitoring and reporting measures have been implemented, and will continue to improve in the near future if management measures are put into place utilizing the improved data, which could be expected to reduce bycatch and discards. If an observer program in the South Atlantic snapper grouper fishery was developed, the program would be expected to improve estimates of discards and provide insight to management on measures for reducing bycatch. Additionally, data collection improvements using electronic reporting and monitoring should allow more accurate and timely tracking of catch as well as other capture information. Improved information should benefit stocks by improving accuracy and reducing uncertainty in catch estimates leading to better decisions.

1.4 Effects on Marine Mammals and Birds

Under Section 118 of the Marine Mammal Protection Act (MMPA), NMFS must publish, at least annually, a List of Fisheries (LOF) that places all U.S. commercial fisheries into one of three categories based on the level of incidental serious injury and mortality of marine mammals that occurs in each fishery. Of the gear utilized within the snapper grouper fishery, only the black sea bass pot is considered to pose an entanglement risk to marine mammals. The southeast U.S. Atlantic black sea bass pot sector is included in the grouping of the Atlantic mixed species trap/pot fisheries, which the 2015, 2016, 2017, and 2018 List of Fisheries classifies as a Category II (79 FR 77919, December 29, 2014; 81 FR 20550, April 8, 2016; 82 FR 3655, January 12, 2017; and 83 FR 5349, February 7, 2018, respectively). Gear types used in these fisheries are determined to have occasional incidental mortality and serious injury of marine mammals. For the South Atlantic snapper grouper fishery, the best available data on protected species interactions are from the SEFSC Supplementary Discard Data Program (SDDP) initiated in July of 2000.

The SDDP sub-samples 20% of the vessels with an active permit. Since August 2001, only three interactions with marine mammals have been documented; each was taken by handline gear and each released alive (McCarthy SEFSC database). The longline and hook-and-line gear components of the snapper grouper in the South Atlantic are classified in the 2016, 2017, and 2018 LOF as Category III fisheries.

Commercial and recreational fishers in the South Atlantic snapper grouper fishery use hook-and-line gear, spear/powerheads, and pot/traps to target black sea bass, but only pots may adversely affect North Atlantic Right whales (NARWs) (NMFS 2016). Although the black sea bass pot sector can pose an entanglement risk to large whales due to their distribution and occurrence, sperm, fin, sei, and blue whales are unlikely to overlap with the black sea bass pot sector operated within the snapper grouper fishery since it is executed primarily off North Carolina and South Carolina in waters ranging from 70-120 feet deep (21.3- 36.6 meters). NMFS estimated that the number of annual lethal takes for NARWs from black sea bass trap/pot gear ranged from an estimated minimum of 0.005 to a maximum of 0.08. This equates to 1 estimated lethal entanglement approximately every 25 to 42 years.

On December 1, 2016, NMFS completed its most recent biological opinion (2016 Opinion) on the snapper grouper FMP (NMFS 2016). In the 2016 Opinion, NMFS concluded that the snapper grouper fishery's continued authorization is likely to adversely affect but is not likely to jeopardize the continued existence of the NARW, loggerhead sea turtle Northwest Atlantic distinct population segments (DPS), leatherback sea turtle, Kemp's ridley sea turtle, green sea turtle North Atlantic DPS, green sea turtle South Atlantic DPS, hawksbill sea turtle, smalltooth sawfish U.S. DPS, or Nassau grouper. Summary information on the species that may be adversely affected by the snapper grouper fishery and how they are affected is presented **Section 3.2.5**.

The Bermuda petrel and roseate tern occur within the action area. Bermuda petrels are occasionally seen in the waters of the Gulf Stream off the coasts of North Carolina and South Carolina during the summer. Sightings are considered rare and only occurring in low numbers (Alsop 2001). Roseate terns occur widely along the Atlantic coast during the summer but in the southeast region, they are found mainly off the Florida Keys (unpublished US Fish and Wildlife Service data). Interaction with fisheries has not been reported as a concern for either of these species. Fishing effort reductions have the potential to reduce the amount of interactions between the fishery and marine mammals and birds. Although, the Bermuda petrel and roseate tern occur within the action area, these species are not commonly found and neither has been described as associating with vessels or having had interactions with the snapper grouper fishery. Thus, it is believed that the snapper grouper fishery is not likely to negatively affect the Bermuda petrel and the roseate tern.

1.5 Changes in Fishing, Processing, Disposal, and Marketing Costs

Research and monitoring is ongoing to understand the effectiveness of proposed management measures and their effect on bycatch. In 1990, the SEFSC initiated a logbook program for vessels with federal permits in the snapper grouper fishery from the Gulf of Mexico and South Atlantic. Approximately 20% of commercial fishermen are asked to fill out discard information in logbooks; however, a greater percentage of fishermen could be selected with emphasis on individuals that dominate landings. The SEFSC is developing electronic logbooks, which could be used to enable fishery managers

to obtain information on species composition, size distribution, geographic range, disposition, and depth of fishes that are released. Further, the Joint Commercial Logbook Reporting Amendment is being developed by the South Atlantic Council and the Gulf of Mexico Council, which would require electronic reporting of landings information by federally permitted commercial vessels to increase the timeliness and accuracy of landings and discard data.

Recreational discards are obtained from MRIP and logbooks from the NMFS headboat program. Additional data collection activities for the recreational sector are being considered by the South Atlantic Council that could allow for a better monitoring of snapper grouper bycatch in the future. Some observer information has been provided by Marine Fisheries Initiative and Cooperative Research Programs (CRP), but more is desired for the snapper grouper fishery. In December 2012, the Southeast Region Headboat Survey underwent a transition from paper logbooks to electronic logbooks, which is expected to improve the quality of data in that sector. As of January 1, 2013, a new electronic logbook replaced the paper logbook form. The form is available through a password protected Web site on the Internet, which can be accessed by personal computer, computer tablet, or "smart phone". The South Atlantic Council approved the For-Hire Amendment at their March 2013 meeting, which was approved and implemented in January 2014. This amendment requires weekly electronic reporting by the headboat sector.

Cooperative research projects between science and industry are being used to a limited extent to collect bycatch information on the snapper grouper fishery in the South Atlantic. For example, Harris and Stephen (2005) characterized the entire (retained and discarded) catch of reef fishes from a selected commercial fisherman in the South Atlantic including total catch composition and disposition of fishes that were released. The Gulf and South Atlantic Fisheries Foundation, Inc. conducted a fishery observer program within the snapper grouper vertical hook-and-line (bandit rig) fishery of the South Atlantic United States. Through contractors they randomly placed observers on cooperating vessels to collect a variety of data quantifying the participation, gear, effort, catch, and discards within the fishery.

In the spring 2010, Archipelago Marine Research Ltd. worked with North Carolina Sea Grant and several South Atlantic Unlimited Snapper Grouper Permit holders to test the effectiveness of electronic video monitoring to measure catch and bycatch. A total of 93 trips were monitored with video monitoring, 34 by self-reported fishing logbooks, and 5 by observers. Comparisons between electronic video monitoring data and observer data showed that video monitoring was a reliable source of catch and bycatch data.

Research funds for observer programs, as well as gear testing and testing of electronic devices are also available each year in the form of grants from the Marine Fisheries Initiative, Saltonstall-Kennedy program, and the CRP. Efforts are made to emphasize the need for observer and logbook data in requests for proposals issued by granting agencies. A condition of funding for these projects is that data are made available to the Councils and NMFS upon completion of a study.

NMFS established the South East Fishery-Independent Survey in 2010 to strengthen fishery-independent sampling efforts in southeast U.S. waters, addressing both immediate and long-term fishery-independent data needs, with an overarching goal of improving fishery independent data utility for stock assessments. Meeting these data needs is critical to improving scientific advice to the management process, ensuring overfishing does not occur, and successfully rebuilding overfished stocks on schedule.

1.6 Changes in Fishing Practices and Behavior of Fishermen

Changes in trip limits and split commercial seasons through Regulatory Amendment 27 could result in a modification of fishing practices by commercial fishers, thereby affecting the magnitude of discards during the designated timeframe. Whereas it is likely bycatch of species in the snapper grouper FMU will be reduced for many of the actions, there is a potential for the discards to increase in other fisheries if fishing seasons are not aligned between species with high co-occurrence or trip limits are overly restrictive. However, as discussed in **Section 1.1** of this BPA, the magnitude of discards is not expected to be significantly affected for most of the proposed actions. It is difficult to quantify any of the measures in terms of reducing discards until bycatch has been monitored over several years. Commercial bycatch information is collected by NMFS, and that information will continue to be analyzed to determine what changes, if any, have taken place in terms of fishing practices and fishing behavior as a result of the actions implemented through Regulatory Amendment 27.

Social effects of actions proposed in Regulatory Amendment 27 are addressed in **Chapter 4** of this document. **Section 3.4** includes information on environmental justice.

Fishermen can be educated about methods to reduce bycatch and enhance survival of regulatory discards. Whereas improving survival may be advantageous for mid-shelf species, it is more of a challenge for deep-water species that can experience nearly 100% mortality from depth related trauma. Furthermore, it is not clear that changes in behavior could substantially affect the amount of bycatch incurred. Gear changes such as hook type or hook size could have some effect on reducing bycatch mortality. Furthermore, spawning seasons with stricter regulations, new or reduced quotas, reduced bag and trip limits, and increased size limits could cause some commercial fishers to reduce or shift effort.

1.7 Changes in Research, Administration, and Enforcement Costs and Management Effectiveness

The proposed actions are not expected to significantly impact administrative costs. Trip limits, size limits, and catch monitoring are currently used to regulate the commercial fishery. All these measures will require additional research to determine the magnitude and extent of changes in bycatch and bycatch mortality. Additional administrative and enforcement efforts would help to implement and enforce fishery regulations. NMFS established the South East Fishery-Independent Survey in 2010 to strengthen fishery-independent sampling efforts in southeast U.S. waters, addressing both immediate and long-term fishery-independent data needs, with an overarching goal of improving fishery independent data utility for stock assessments. Meeting these data needs is critical to improving scientific advice to the management process, ensuring overfishing does not occur, and successfully rebuilding overfished stocks on schedule.

1.8 Changes in the Economic, Social, or Cultural Value of Fishing Activities and Non-Consumptive Uses of Fishery Resources

Any changes in economic, social, or cultural values from the proposed actions are discussed in **Chapter 4** of the environmental assessment.

1.9 Changes in the Distribution of Benefits and Costs

The distribution of benefits and costs expected from proposed actions in the environmental assessment are discussed in **Chapter 3**. Economic and social effects of the proposed actions are addressed in **Chapter 4** of this document.

1.10 Social Effects

The social effects of all the measures are described in **Chapter 4** of the environmental assessment.

Conclusion

The bycatch practicability analysis evaluates taking additional action to minimize bycatch and bycatch mortality using the ten factors provided at 50 CFR section 600.350(d)(3)(i). In summary, measures proposed in Regulatory Amendment 27 are intended to modify commercial regulations such as fishing seasons, trip limits, seasonal closures, and size limits for species in the snapper grouper commercial fishery. These actions are necessary to enable equitable access for fishers participating in the fishery and minimize discards while minimizing, to the extent practicable, adverse social and economic effects. As summarized in **Section 1.1** of this BPA, the actions in Regulatory Amendment 27 are not expected to result in significant changes in bycatch for most of the actions. In addition, the Council, NMFS, and the SEFSC have implemented and plan to implement numerous management measures and reporting requirements that have improved, or are likely to improve monitoring efforts of discards and discard mortality. Therefore, no additional action is needed to minimize bycatch or bycatch mortality within the snapper grouper fishery.

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