Regulatory Amendment 33

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

Modifications to red snapper season specifications

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

August 21, 2019

South Atlantic Fishery Management Council
4055 Faber Place Drive; Suite 201
North Charleston, SC 29405

Award Number FNA15NMF4410010

Abbreviations and Acronyms Used in the FMP

ABC	acceptable biological catch
ACL	annual catch limit
AM	accountability measure
ACT	annual catch target
B	a measure of stock biomass in either weight or other appropriate unit
B_{MSY}	the stock biomass expected to exist under equilibrium conditions when fishing at F_{MSY}
B_{OY}	the stock biomass expected to exist under equilibrium conditions when fishing at F_{OY}
B_{CURR}	the current stock biomass
CPUE	catch per unit effort
DEIS	draft environmental impact statement
EA	environmental assessment
EEZ	exclusive economic zone
EFH	essential fish habitat
F	a measure of the instantaneous rate of fishing mortality
$F_{30\%SPR}$	fishing mortality that will produce a static SPR = 30%
F_{MSY}	the rate of fishing mortality expected to achieve MSY under equilibrium conditions and a corresponding biomass of B_{MSY}
F_{OY}	the rate of fishing mortality expected to achieve OY under equilibrium conditions and a corresponding biomass of B_{OY}
FMP	fishery management plan
FMU	fishery management unit
M	natural mortality rate
MARMAP	Marine Resources Monitoring Assessment and Prediction Program
MFMT	maximum fishing mortality threshold
MMPA	Marine Mammal Protection Act
MRFSS	Marine Recreational Fisheries Statistics Survey
MRIP	Marine Recreational Information Program
MSST	minimum stock size threshold
MSY	maximum sustainable yield
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OFL	overfishing limit
OY	optimum yield
RFA	Regulatory Flexibility Act
RIR	Regulatory Impact Review
SAFMC	South Atlantic Fishery Management Council
SEDAR	Southeast Data Assessment and Review
SEFSC	Southeast Fisheries Science Center
SERO	Southeast Regional Office
SIA	social impact assessment
SPR	spawning potential ratio
SSC	Scientific and Statistical Committee
SMZ	special management zone
SPR	spawning potential ratio
SSB	stock spawning biomass

SSC Scientific and Statistical Committee

TAC total allowable catch

Regulatory Amendment 33 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region

Proposed actions:	Modify the South Atlantic red snapper season specifications.

Responsible Agencies and Contact Persons

South Atlantic Fishery Management Council
4055 Faber Place, Suite 201
North Charleston, South Carolina 29405
IPT lead: Myra Brouwer
myra.brouwer@safmc.net

843-571-4366
843-769-4520 (fax)
www.safmc.net

National Marine Fisheries Service
Southeast Regional Office
263 13th Avenue South
St. Petersburg, Florida 33701
IPT lead: Frank Helies
frank.helies@noaa.gov

727-824-5305
727-824-5308 (fax)
http://sero.nmfs.noaa.gov

Table of Contents

List of Appendices

List of Tables

List of Figures

Summary

Why is the South Atlantic Fishery Management Council considering action?

The South Atlantic Fishery Management Council (South Atlantic Council) discussed modifying the days of the week that are open to red snapper recreational harvest starting in 2020, should harvest be allowed, to maximize fishing opportunity in the event of bad weather. The South Atlantic Council was concerned that limiting the recreational season to consecutive "weekends" during the summer months could increase the chances of losing an entire weekend to fishing opportunities for red snapper because of poor weather conditions. The South Atlantic Council also expressed interest in having periodic review of how limited openings are working and providing the public an opportunity to provide feedback on the seasons. Additionally, the South Atlantic Council intends to explore changing the start dates for the commercial and recreational seasons to optimize fishing opportunities while minimizing discard mortality.

Purpose and Need

The purpose and need of this framework amendment are to modify the structure of the South Atlantic red snapper commercial and recreational fishing seasons to increase the socio-economic benefits to fishermen and fishing communities while minimizing discard mortality.

What actions are being proposed in this framework amendment?

Regulatory Amendment 33 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region proposes the following:

NOTE: Will update after any Council modification at the September meeting

Action 1. Remove the minimum number of days for the South Atlantic red snapper seasons

Currently: If the projected commercial or recreational fishing season is determined by the National Marine Fisheries Service to be three days or less, then the commercial or recreational fishing season will not open for that fishing year.

Alternative 2. Remove the requirement specifying the red snapper recreational and commercial seasons in the South Atlantic would not open if projections indicate the recreational or commercial season would be three days or less.

Action 2. Modify the start date for the recreational red snapper season

Currently: The recreational season, which consists of weekends only (Fridays, Saturdays, and Sundays) begins on the second Friday in July, unless otherwise specified.

Alternative 2. Modify the recreational red snapper season to start on May 1.
Sub-alternative 2a. First week
Sub-alternative 2b. Second week
Sub-alternative 2c. Third week
Sub-alternative 2d. Fourth week

Alternative 3. Modify the recreational red snapper season to start on June 1.
Sub-alternative 3a. First week
Sub-alternative 3b. Second week
Sub-alternative 3c. Third week
Sub-alternative 3d. Fourth week

Alternative 4. Modify the recreational red snapper season to start onSeptember 1.
Sub-alternative 4a. First week
Sub-alternative 4b. Second week
Sub-alternative 4c. Third week
Sub-alternative 4d. Fourth week

Alternative 5. Modify the recreational season to start on May 1 for a portion of the projected allowable fishing days (Council to determine in March?) and resume harvest in

the fall (when??) if the National Marine Fisheries Service determines the entire recreational annual catch limit was not harvested.

Action 3. Revise the days of the week recreational harvest of red snapper would be allowed during an open season

Currently: If the National Marine Fisheries Service determines that recreational harvest of red snapper is allowed in a given fishing year, the recreational season consists of weekends only (Fridays, Saturdays, and Sundays).

NOTE: multiple preferred sub-alternatives could be chosen.

Alternative 2. When a red snapper recreational season is projected to take place harvest would be allowed on consecutive Mondays.

Alternative 3. When a red snapper recreational season is projected to take place, harvest would be allowed on consecutive Fridays.

Alternative 4. When a red snapper recreational season is projected to take place, harvest would be allowed on consecutive Saturdays.

Alternative 5. When a red snapper recreational season is projected to take place, harvest would be allowed on consecutive Sundays.

Alternative 6. When a red snapper recreational season is projected to take place, and depending on the projected numbers of days, harvest would be allowed every other weekend.

Sub-alternative 6a. Weekend consists of Fridays and Saturdays
Sub-alternative 6b. Weekend consists of Saturdays and Sundays
Sub-alternative 6c. Weekend consists of Fridays, Saturdays, and Sundays

Alternative 7. When a red snapper recreational season is projected to take place, and depending on the projected number of days, harvest would be allowed the last weekend of each month.

Sub-alternative 7a. Weekend consists of Fridays and Saturdays
Sub-alternative 7b. Weekend consists of Saturdays and Sundays
Sub-alternative 7c. Weekend consists of Fridays, Saturdays, and Sundays

Alternative 8. When a red snapper recreational season is projected to take place, the National Marine Fisheries Service will present the season length to the South Atlantic Council at the annual March meeting, if the analysis and data are available, and the South Atlantic Council will provide recommendations to the National Marine Fisheries Service on what dates they want open. The National Marine Fisheries Service will announce the opening of the fishing season through the *Federal Register* and other methods deemed appropriate. The end of the recreational red snapper season will be pre-determined and announced before the start of the recreational season. The open days do not need to be consecutive.

Action 4. Modify the start date for the red snapper commercial season

Currently: The commercial red snapper season begins on the second Monday in July, unless otherwise specified.

Alternative 2. Modify the commercial red snapper season start date to the second Monday in May, unless otherwise specified.

Alternative 3. Modify the commercial red snapper season start date to the second Monday in June, unless otherwise specified.

Alternative 4. Modify the commercial red snapper season start date to May 1. Commercial harvest would not be allowed during July and August.

Chapter 1. Introduction

1.1 What actions are being proposed in this framework amendment?

This framework amendment proposes modifications to recreational and commercial red snapper fishing seasons. Actions include removing the requirement that if projections indicate the red snapper season (commercial or recreational) would be three days or fewer, the commercial and recreational seasons would not open for that fishing year; modifying the start date (month) and the days of the week recreational harvest of red snapper would be allowed during an open recreational season; and modifying the start date of the commercial red snapper season.

South Atlantic Fishery Management Council

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

1.2 Who is proposing the framework amendment?

The South Atlantic Fishery Management Council (Council) develops the framework amendment and submits it to the National Marine Fisheries Service (NMFS). NMFS is an agency of the National Oceanic and Atmospheric Administration. NMFS implements the actions in the framework amendment through the development of regulations. The Council and NMFS are also responsible for making this document available for public comment. The draft environmental assessment is made available to the public during the scoping process, public hearings, and in Council meeting briefing books.

1.3 Where is the project located?

Management of the federal snapper grouper fishery located off the southeastern United States (South Atlantic) in the 3-200 nautical miles U.S. Exclusive Economic Zone (EEZ) is conducted under the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper GrouperFMP) (SAFMC 1983) (**Figure 1.3.1**). There are 55 species managed by the South Atlantic Council under the Snapper Grouper FMP.

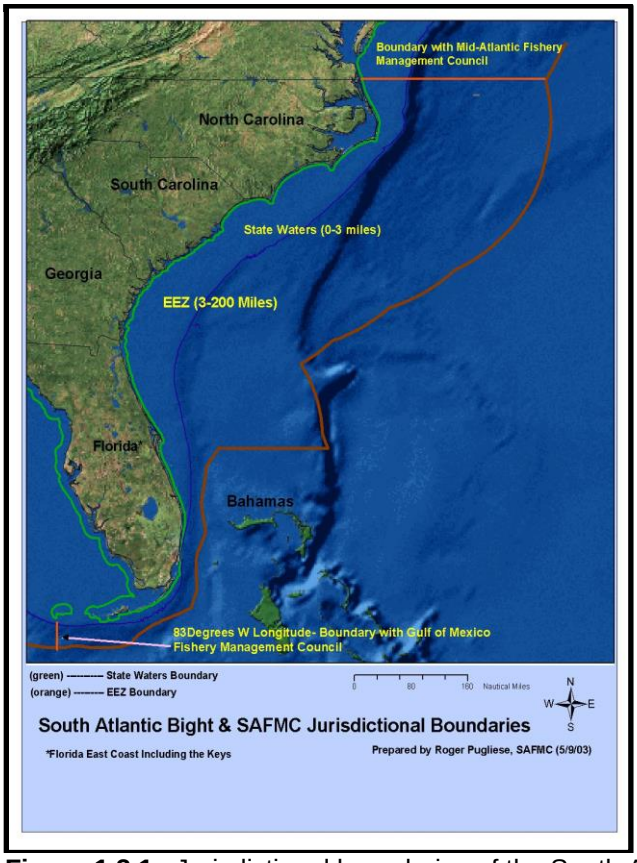


Figure 1.3.1. Jurisdictional boundaries of the South Atlantic Council.

1.4 Why is the South Atlantic Council considering action (Purpose and Need)

The purpose and need of this framework amendment are to modify the structure of the South Atlantic red snapper commercial and recreational fishing seasons to increase the socio-economic benefits to fishermen and fishing communities while minimizing discard mortality.

1.5 What is the history of management for red snapper?

The snapper grouper fishery is highly regulated and regulations have been in place for red snapper since the initial development of the Snapper Grouper FMP in 1983. A detailed history of management for all species in the snapper grouper fishery management unit are listed in **Appendix C**. Below is an annotated list of fishery management plan/amendments that contained actions specifically related to red snapper.

Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (1983)

The original Snapper Grouper FMP included provisions to prevent growth overfishing in thirteen species in the snapper grouper complex and established a procedure for preventing overfishing in other species; established minimum size limits for red snapper, yellowtail snapper, red grouper, Nassau grouper, and black sea bass; established a 4-inch trawl mesh size to achieve a 12-inch total length minimum size limit for vermilion snapper; and included additional harvest and gear limitations.

Amendment 4 (1991)

Amendment 4 to the Snapper Grouper FMP prohibited the use of various gear, including fish traps, the use of bottom longlines for wreckfish, and powerheads in special management zones off South Carolina; established bag limits and minimum size limits for several species (20 inch total length minimum size limit and two fish bag limit for red snapper); required permits (commercial and for-hire) and specified data collection regulations; and required that all snapper grouper species possessed in the South Atlantic EEZ must have heads and fins intact through landing.

Amendment 11 (1998)

Amendment 11 amended the Snapper Grouper FMP to make definitions of maximum sustainable yield (MSY), optimum yield, overfishing, and overfished consistent with National Standard Guidelines. Amendment 11 also identified and defined fishing communities, addressed bycatch management measures, and defined the red snapper F_{MSY} proxy as $F_{30\%SPR}$.

Interim Rule for Red Snapper (2009)

In 2008, the Council received notification (letter dated July 8) that the South Atlantic red snapper stock was undergoing overfishing and was overfished. In March 2009, the Council requested that NMFS establish interim measures to reduce overfishing and fishing pressure on the red snapper stock. Interim measures became effective on January 4, 2010. The interim rule was effective until June 2, 2010, but was extended for an additional 186 days since the Council was developing long-term management measures in Amendment 17A to the Snapper Grouper FMP to end overfishing of red snapper and rebuild the stock.

Amendment 17A (2010)

Actions in Amendment 17A included a harvest prohibition for red snapper and an area closure for all snapper grouper species. The area closure was 4,827 square miles and extended from southern Georgia to northern Florida where harvest and possession of all snapper grouper species would be prohibited (except when fishing with black sea bass pots or spearfishing gear for species other than red snapper). The red snapper prohibition was effective on January 3, 2011; however, NMFS delayed the effective date of the area closure until June 1, 2011, via an emergency rule, to allow time to review the results of a new red snapper stock assessment (SEDAR 24 2010).

The results of SEDAR 24 showed red snapper to be overfished and undergoing overfishing; however, the rate of overfishing found in SEDAR 24 was less than the rate of overfishing found in the previous stock assessment (SEDAR 15 2008). Based on the results from SEDAR 24, evidence of decreased effort in the recreational sector, and recommendations from their Scientific and Statistical Committee, the Council determined that the area closure approved in Amendment 17A, in addition to the harvest prohibition, was more conservative than what was necessary to end overfishing of red snapper.

Amendment 17A also required the use of non-stainless steel circle hooks when fishing for snapper grouper species with hook-and-line gear and natural baits in the South Atlantic EEZ north of 28 degrees North latitude and specified a fishery-independent monitoring program for red snapper.

Comprehensive Annual Catch Limits (ACL) Amendment (Amendment 25) (2011)

The Comprehensive ACL Amendment established sector allocations for many snapper grouper species, including red snapper, using an allocation formula based on historic and recent average landings. The commercial allocation for red snapper was set at 28.07% and the recreational allocation was set at 71.93%.

Regulatory Amendment 10 (2011)

In December 2010, the Council approved Regulatory Amendment 10 for review by the Secretary of Commerce by a unanimous vote. The action in Regulatory Amendment 10 eliminated the snapper grouper area closure approved in Amendment 17A. Regulatory Amendment 10 was implemented and became effective on May 31, 2011.

Emergency Rule (2012)

The rule established red snapper seasons for the commercial and recreational sectors in the South Atlantic EEZ in 2012.

Amendment 28 (2013)

The amendment set the commercial and recreational ACLs and seasons to allow limited harvest of red snapper in 2013. In addition, the amendment established a process to determine whether limited commercial and recreational fishing seasons in the South Atlantic EEZ could

occur during a given fishing year, and specified management measures should limited harvest be allowed.

Regulatory Amendment 21 (2014)

The amendment changed the Minimum Stock Size Threshold (MSST) definition for eight snapper grouper species including red snapper from MSST = [(1-M) or 0.5 whichever is greater]*B_{MSY} to 0.75*B_{MSY}.

Emergency Rule (2017)

The rule established red snapper seasons for the commercial and recreational sectors in the South Atlantic EEZ in 2017.

Amendment 43 (2017)

The amendment removed the process and equation used to determine the red snapper ACL adopted in Amendment 28 and specified a total ACL of 42,510 fish. The commercial and recreational ACLs were set at 124,815 pounds (whole weight) and 29,656 fish, respectively, according to established sector allocations. The ACL was based on the highest observed landings of red snapper in a single year from 2012 through 2014.

Chapter 2. Proposed Actions and Alternatives

2.1 Action 1. Remove the minimum number of days for the South Atlantic red snapper seasons

Alternative 1 (No Action). If the projected commercial or recreational fishing season is determined by the National Marine Fisheries Service to be three days or less then the commercial or recreational fishing season will not open for that fishing year.

Alternative 2. Remove the requirement specifying the red snapper recreational and commercial seasons in the South Atlantic would not open if projections indicate the recreational or commercial season would be three days or fewer.

Discussion: This action would remove the requirement that a red snapper season (commercial or recreational) be at least three days. If this requirement is removed, red snapper harvest could be open for either recreational or commercial harvest for less than three days.

2.1.1 Comparison of Alternatives:

2.2 Action 2. Modify the start date for the recreational red snapper season

Alternative 1 (No Action). The recreational season, which consists of weekends only (Fridays, Saturdays, and Sundays), begins on the second Friday in July, unless otherwise specified.

Alternative 2. Modify the recreational red snapper season to start ~~on~~ in May ~~1~~.

Sub-alternative 2a. First week
Sub-alternative 2b. Second week
Sub-alternative 2c. Third week
Sub-alternative 2d. Fourth week

Alternative 3. Modify the recreational red snapper season to start ~~on~~ in June ~~1~~.

Sub-alternative 3a. First week
Sub-alternative 3b. Second week
Sub-alternative 3c. Third week
Sub-alternative 3d. Fourth week

Alternative 4. Modify the recreational red snapper season to start ~~on~~ in September ~~1~~.

Sub-alternative 4a. First week
Sub-alternative 4b. Second week
Sub-alternative 4c. Third week
Sub-alternative 4d. Fourth week

Alternative 5. Modify the recreational season to start on May 1 for a portion of the projected allowable fishing days (Council to determine in March?) and resume harvest in the fall (when??) if NMFS determines the entire recreational annual catch limit was not harvested.

Discussion: Action 2 specifies the month and week the recreational season would start whereas Action 3 specifies the day(s) of the week harvest would be allowed during future openings. Together, these two actions would modify the timing of future recreational red snapper seasons.

2.1.2 Comparison of Alternatives:

2.3 Action 3. Revise the days of the week recreational harvest of red snapper would be allowed during an open season

Alternative 1 (No Action). If the National Marine Fisheries Service determines that recreational harvest of red snapper is allowed in a given fishing year, the recreational season consists of weekends only (Fridays, Saturdays, and Sundays).

NOTE: multiple preferred sub-alternatives could be chosen.
Alternative 2. When a red snapper recreational season is projected to take place, harvest would be allowed on consecutive Mondays.

Alternative 3. When a red snapper recreational season is projected to take place, harvest would be allowed on consecutive Fridays.

Alternative 4. When a red snapper recreational season is projected to take place, harvest would be allowed on consecutive Saturdays.

Alternative 5. When a red snapper recreational season is projected to take place, harvest would be allowed on consecutive Sundays.

Alternative 6. When a red snapper recreational season is projected to take place, and depending on the projected numbers of days, harvest would be allowed every other weekend.

Sub-alternative 6a. Weekend consists of Fridays and Saturdays
Sub-alternative 6b. Weekend consists of Saturdays and Sundays
Sub-alternative 6c. Weekend consists of Fridays, Saturdays, and Sundays

Alternative 7. When a red snapper recreational season is projected to take place, and depending on the projected number of days, harvest would be allowed the last weekend of each month.

Sub-alternative 7a. Weekend consists of Fridays and Saturdays
Sub-alternative 7b. Weekend consists of Saturdays and Sundays
Sub-alternative 7c. Weekend consists of Fridays, Saturdays, and Sundays

Alternative 8. When a red snapper recreational season is projected to take place, the National Marine Fisheries Service will present the season length to the South Atlantic Fishery Management Council at the annual March meeting, if the analysis and data are available, and the South Atlantic Fishery Management Council will provide recommendations to the National Marine Fisheries Service on what dates they want open. The National Marine Fisheries Service will announce the opening of the fishing season~~through the Federal Register and other methods deemed appropriate.~~ The end of the recreational red snapper season will be pre-determined and announced before the start of the recreational season. The open days do not need to be consecutive.

Discussion: This action allows more flexibility in how recreational harvest of red snapper could be structured during future openings. The South Atlantic Fishery Management Council

(Council) could choose multiple preferred alternatives among **Alternatives 2-5** (e.g., allow harvest on consecutive Fridays and Saturdays). **Alternatives 6** and **7** provide the option to allow recreational harvest every other weekend or the last weekend of each month, respectively, also allowing to define which days constitute a "weekend." **Alternative 8** may provide the most flexibility in that fishery managers would decide in March of each year how to "spread out" the allowable red snapper harvest for that year. This alternative would be further developed to specify the annual process (i.e., what data would be needed and by when, how long of a public comment period would be needed, and how the public would be notified and by when).

2.1.3 Comparison of Alternatives:

2.4 Action 4. Modify the ~~start date for the~~ red snapper commercial season

Alternative 1 (No Action). The commercial red snapper season begins on the second Monday in July, unless otherwise specified.

Alternative 2. Modify the commercial red snapper season start date to the second Monday in May, unless otherwise specified.

Alternative 3. Modify the commercial red snapper season start date to the second Monday in June, unless otherwise specified.

Alternative 4. Modify the commercial red snapper season start date to May 1. Commercial harvest would not be allowed during July and August.

Discussion: This action proposes changing the start date for the commercial red snapper season to May (**Alternative 2**) or June (**Alternative 3**). Additionally, **Alternative 4** would allow harvest to begin on May 1 to coincide with the opening of shallow-water groupers but would prohibit red snapper harvest in July and August. Based on when and if the red snapper commercial ACL was previously reached (November/December in 2018), it is unlikely that the entirety of the current ACL would be harvested in May. Therefore, **Alternative 4** would essentially establish a split season for commercial harvest of red snapper. Commercial harvest would occur in May and June and resume in September until the entire ACL was landed.

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 four major components:

- **Habitat environment** (Section 3.1)
- **Biological and Ecological environment** (Section 3.2)
- **Economic and Social environment** (Sections 3.3)
- **Administrative environment** (Section 3.4)

3.1 Habitat Environment

3.1.1 Inshore/Estuarine Habitat

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 (FEP; SAFMC 2009b) and incorporated here by reference. The FEP can be found at: http://safmc.net/ecosystem-management/fishery-ecosystem-plan/.

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).

The distribution of coral and live hard bottom habitat as presented in the Southeast Marine Assessment and Prediction Program (SEAMAP) bottom mapping project is a proxy for the distribution of the species within the snapper grouper complex. The method used to determine hard bottom habitat relied on the identification of reef obligate species including members of the snapper grouper complex. The Florida Fish and Wildlife Research Institute, using the best available information on the distribution of hard bottom habitat in the South Atlantic region, prepared ArcView maps for the four-state project. These maps, which consolidate known distribution of coral, hard/live bottom, and artificial reefs as hard bottom, are available on the

South Atlantic Fishery Management Council's (Council) online map services provided by the newly developed SAFMC Habitat and Ecosystem Atlas[1]

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 Internet Mapping System at the above address.

Additional information on the habitat utilized by snapper grouper species is included in Volume II of the Fishery Ecosystem Plan (FEP; SAFMC 2009b). The FEP can be found at: http://safmc.net/ecosystem-management/fishery-ecosystem-plan/.

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;

[1] http://ocean.floridamarine.org/safmc_atlas/.
An introduction to the system is found at: http://www.safmc.net/ecosystem-management/mapping-and-gis-data.

unconsolidated bottom (soft sediments); artificial reefs; and coral reefs and live/hard bottom habitats.

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; Council-designated Artificial Reef Special Management Zones (SMZs); and deep-water Marine Protected Areas. 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 National Marine Fisheries Service (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 amendment may have on EFH, and EFH-HAPCs are discussed in **Chapter 4** of this document.

3.2 Biological and Ecological Environment

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.

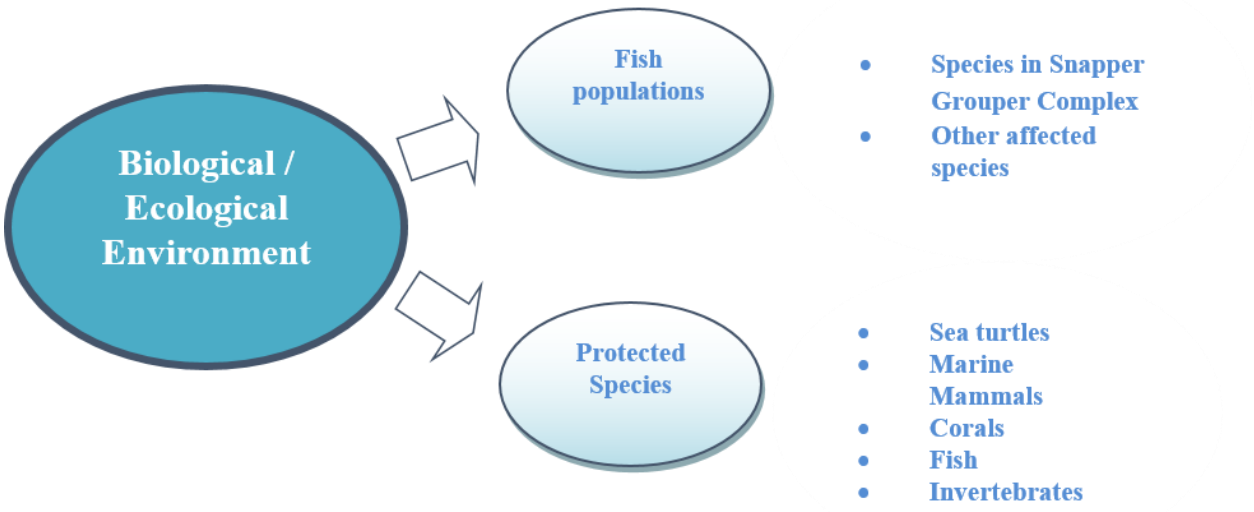


Figure 3.2.1. Two components of the biological environment described in this document.

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" nor "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 (e.g., 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 (e.g., 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 dictates the nature of the fishery (multi-species) and further forms the type of management regulations proposed in this document.

3.2.1 Fish Populations Affected by this Amendment

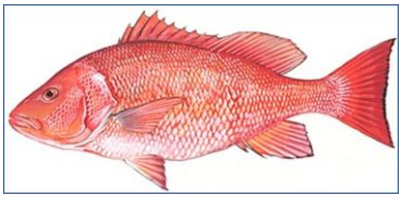
The species directly affected by actions proposed in this amendment is red snapper.

Life History

The red snapper is found from North Carolina to the Florida Keys and throughout the Gulf of Mexico to the Yucatan Peninsula (Robins and Ray 1986). It can be found at depths from 10 to 190 m (33-623 ft). Adults usually occur over rocky bottoms. Juveniles inhabit shallow waters and are common over sandy or muddy bottom habitat (Allen 1985).

Juvenile (Age 0) red snapper are rarely encountered in the U.S. South Atlantic. SEAMAPs fishery-independent trawling survey collected three in 1999, two in 2000, seven in 2013, and four in 2014 in nearshore (<30 ft deep) habitat. A headboat fisherman landed one age-0 red snapper during the 2012 mini-season. One age-0 fish was landed in the commercial fishery in 1980. Fishermen have reported observing juvenile red snapper on artificial reefs in shallow water. Estimates of juvenile red snapper mortality have been developed in the Gulf of Mexico; however, little information is available for the U.S. South Atlantic (SEDAR 41 2017).

Red snapper Life History
An Overview



- Extend from North Carolina to the Florida Keys, and throughout the Gulf of Mexico to the Yucatan Peninsula
- Waters ranging from 33-623 feet
- Red snapper do not migrate but can move long distances
- The spawning season extends from April to October, with peaks in June through August.
- Can live for at least 51 years

The maximum size reported for this species is 100 cm (40 in) total length (TL) (Allen 1985; Robins and Ray 1986) and 22.8 kg (50 lbs) (Allen 1985). For samples collected from North Carolina to eastern Florida, maximum reported age is 45 years (White and Palmer 2004). The most recent maximum observed age for red snapper is 51 years. This fish was a 904 mm (36 in) TL female, and was caught in 2003 at 67 meters depth off Florida by a charter boat fisherman (SEDAR 41 2017).

In the U.S. South Atlantic, recent analyses (SEDAR 41 2017) estimate that 50% of female red snapper are mature at 1.3 years old and 325 mm (12.8 in) TL. Fifty percent of male red snapper are mature at 166 mm (6.5 in) TL (SEDAR 41 2017). Grimes (1987) found that the spawning season of this species varies with location, but in most cases occurs nearly year round. According to research used in SEDAR 41 (2017), red snapper spawning along the Atlantic coast of the southeastern U.S. generally occurs from April through October with peaks during June through August based on the presence of females with spawning indicators. (i.e., the occurrence of hydrated oocytes and/or postovulatory follicles).

Red snapper eat fishes, shrimps, crabs, worms, cephalopods, and some planktonic items (Szedlemayer and Lee 2004).

Landings

Landings information is presented in **Section 3.3.2**.

Stock Status

Manooch et al. (1998) conducted the first formal assessment of red snapper in the South Atlantic. The authors concluded that the status of the stock was not ideal but seemed to be responding to management action. Potts and Brennan (2001) revisited the results of that assessment and suggested a broader range of reduction in fishing mortality (F), from 30% to 80%.

The red snapper stock in the South Atlantic was assessed through the Southeast Data, Assessment, and Review (SEDAR) process in 2007-2008. That assessment applied a statistical catch-age model using data through 2006 (SEDAR 15 2009). The assessment found that overfishing had been occurring since the 1960s and the red snapper stock was overfished. Although quantitative results varied, the qualitative results of overfishing a depleted stock were consistent across all catch-age model configurations examined during and after the assessment process (approximately 40 sensitivity runs), as well as with an alternative model formulation (surplus-production model).

In 2010, a benchmark assessment using the Beaufort Assessment Model (BAM) with data through 2009 was completed (SEDAR 24 2010). BAM is a statistical catch-age model developed by the analysts at the Beaufort, North Carolina, NMFS Southeast Fisheries Science Center (SEFSC) laboratory, and is customizable to the data available. A surplus production model called ASPIC (Prager 1994; Prager 2004) was used as a complement for comparison purposes. Based on the assessment provided from the BAM, the SEDAR Review Panel concluded that the red snapper stock was overfished and overfishing was occurring. Similar to SEDAR 15 (2009), more than 40 sensitivities were run, all of which resulted in the same status determinations.

A benchmark assessment was completed in 2016 (SEDAR 41 2017) with data through 2014. Although the SEDAR Review Panel concluded that assessment results represent the best scientific information available, the Panel identified several areas of uncertainty including the composition and magnitude of recreational discards, the stock-recruitment relationship, potential changes in catch per unit effort (CPUE) catchability, and the selectivities for the different fishery fleets. The Scientific and Statistical Committee (SSC) reviewed the assessment and provided fishing level recommendations at their May 2016 meeting based on $F_{30\%SPR}$ as a proxy for F_{MSY}. The base assessment run suggested that in the terminal year of 2014 the stock remained overfished. The SSC did not have confidence in the terminal fishing mortality estimates; however, they recommended that the assessment results suggested overfishing was likely occurring in the terminal years of the assessment (2012-2014) although the degree to which overfishing was occurring at that time could not be reliably quantified from the assessment results (see May 2016 Final SSC report).

SEDAR 41 (2017) estimated the long-term maximum sustainable yield (MSY) to be about 25% of what it was estimated to be in SEDAR 24 (2010), and projected catch levels from SEDAR 41 at the fishing mortality level predicted to rebuild the stock in the specified timeframe

($F_{Rebuild}$) were approximately 21% of the catch levels projected for 2017 based on SEDAR 24 (2010). Given this, and the various sources of uncertainty in the SEDAR 41 (2017) assessment, the Council sought the SSC's recommendations on additional projection runs and reference point criteria, reliability of Marine Recreational Information Program (MRIP) estimates for red snapper (landings and discards), and the risk associated with using different values of MSY. In addition, the Council requested that projections under a discards-only scenario be provided for discussion at their March 2017 meeting. However, the SEFSC indicated the projections could not be completed due to the length of time since the completion of the assessment, uncertainty in the landings since most landings are coming from discards, and the change in MRIP methodology for estimating landings and discards. Moreover, the Council received a letter from NMFS stating the Council has likely taken sufficient action to address overfishing of red snapper in the South Atlantic and should focus efforts on a methodology to obtain an ABC for red snapper. SEDAR 41 was updated due to revisions in the headboat index and presented to the SSC in April 2017. Due to the issues laid out by the SEFSC, the Council requested that the SEFSC and the SSC collaborate to explore approaches to arrive at an ABC for red snapper that can be applied to a long-term management approach.

3.2.2 Bycatch and Discards

The snapper grouper fishery is a multi-species fishery, which uses mostly hook-and-line gear although some trips use other gear such as pots/traps and spears. While the red snapper component of the snapper grouper fishery has been closed, red snapper have been bycatch in the fishery. Bycatch of red snapper is commonly associated with catches of black sea bass, red grouper, gag, scamp, greater amberjack, vermilion snapper, and gray triggerfish. The actions in this amendment are not expected to result in significant changes in bycatch of red snapper and may reduce bycatch of red snapper during limited open seasons (**Appendix D**). In addition, the Council, the 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 in the snapper grouper fishery. See **Appendix D** for detailed descriptions of bycatch when fishing for red snapper.

3.2.3 The Stock Assessment Process

The Southeast Data, Assessment, and Review (SEDAR) process is a cooperative Fishery Management Council initiative to improve the quality and reliability of fishery stock assessments in the South Atlantic, Gulf of Mexico, and U.S. Caribbean. The Caribbean, Gulf of Mexico, and South Atlantic Fishery Management Councils manage SEDAR in coordination with NMFS and the Atlantic and Gulf States Marine Fisheries Commissions. SEDAR seeks improvements in the scientific quality of stock assessments, constituent and stakeholder participation in assessment development, transparency in the assessment process, and a rigorous and independent scientific review of completed stock assessments.

SEDAR is organized around three workshops. First is the Data Workshop, during which fisheries monitoring and life history data are reviewed and compiled. Second is the Assessment

Workshop, which may be conducted via a workshop and several webinars, during which assessment models are developed and population parameters are estimated using the information provided from the Data Workshop. Third and final is the Review Workshop, during which independent experts review the input data, assessment methods, and assessment products. The completed assessment, including the reports of all three workshops and all supporting documentation, are then forwarded to the Council's Scientific and Statistical Committee (SSC). The SSC considers whether the assessment represents the best available science and develops fishing level recommendations for Council consideration.

SEDAR workshops are public meetings organized by SEDAR. Workshop participants appointed by the lead Council are drawn from state and federal agencies, non-government organizations, Council members, Council advisors, and the fishing industry with a goal of including a broad range of disciplines and perspectives. All participants are expected to contribute to this scientific process by preparing working papers, contributing data, providing assessment analyses, evaluating and discussing information presented, and completing the workshop report.

3.2.4 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 (NARW), 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 (sperm, sei, fin, blue, and NARW) 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 Council's jurisdiction.

NMFS has conducted specific analyses ("Section 7 consultations") to evaluate the potential 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 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 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.

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, memorandum NMFS analyzed and 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.

For summary information on the protected species that may be adversely affected by the snapper grouper fishery and how they are affected refer to **Section 3.2.5** in Vision Blueprint Regulatory Amendment 27 (https://www.fisheries.noaa.gov/action/regulatory-amendment-27-vision-blueprint-commercial-measures). 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.

3.3 Economic Environment

Details on red snapper, and the South Atlantic snapper grouper fishery in general, can be found in Snapper Grouper Amendment 17A (SAFMC 2010), the Comprehensive ACL Amendment for the South Atlantic Region (SAFMC 2011), South Atlantic Snapper Grouper Amendment 43 (SAFMC 2017), and South Atlantic Snapper Grouper Amendment 42 (SAFMC 2019).

3.3.1 Economic Description of the Commercial Sector

The major sources of data summarized in this description are the NMFS SERO Permits Information Management System (PIMS) and the SEFSC Social Science Research Group (SSRG) Socioeconomic Panel[2] data set. Inflation adjusted revenues and prices are reported in 2018 dollars.

Permits

Any fishing vessel that harvests and sells any of the snapper grouper species from the South Atlantic EEZ must have a valid South Atlantic commercial snapper grouper permit, which is a limited access permit. As of August 12, 2019, there were 528 valid or renewable South Atlantic Snapper Grouper Unlimited Permits and 103 valid or renewable 225-lb Trip-limited Permits. After a permit expires, it can be renewed or transferred up to one year after the date of expiration. The number of valid or renewable snapper grouper permits declined steadily from 2014 through 2018 (**Table 3.3.1**).

Table 3.3.1. Number of valid or renewable South Atlantic commercial snapper grouper permits.

	Unlimited	225-lb Trip-limited
2014	584	125
2015	571	121
2016	565	116
2017	554	114
2018	549	110
Average	565	117

Source: NMFS SERO Permits Dataset, 2019.

[2] This data set is compiled by the SEFSC SSRG from Federal Logbook System (FLS) data, supplemented by average prices calculated from the Accumulated Landings System (ALS). Because these landings are self-reported, they may diverge slightly from dealer-reported landings presented elsewhere.

Landings, Value, and Effort

The number of federally permitted commercial vessels that landed South Atlantic red snapper dropped in 2015 and 2016, during which time there was no federal commercial red snapper season, and then increased sharply in 2017 and 2018 (**Table 3.3.2**). Landings of red snapper followed a similar pattern. The landings reported in 2015 and 2016 are either from state water catches or misreported/out-of-season harvests. On average (2014 through 2018), vessels that landed red snapper did so on approximately 20% of their South Atlantic trips and red snapper accounted for only 3% of their annual all species revenue, including revenue from Gulf trips (**Table 3.3.2** and **Table 3.3.3**). Average all species vessel-level revenue for these vessels rose in 2015 but fell steadily from 2016 through 2018. The 2014-2018 average vessel-level revenue was approximately $84,000 (2018 dollars). During this time period, the average annual price per pound gutted weight (gw) of red snapper was $5.49 (2018 dollars) and ranged from $4.28 in 2015 to $5.57 in 2018 (**Table 3.3.3**).

Table 3.3.2. Number of vessels, number of trips, and landings (lbs gw) by year for South Atlantic red snapper, 2014-2018. Data for 2018 is incomplete.

Year	# of vessels that caught red snapper (> 0 lbs gw)	# of trips that caught red snapper	Red snapper landings (lbs gw)	Other species' landings jointly caught w/ red snapper (lbs gw)	# of South Atlantic trips that only caught other species	Other species' landings on South Atlantic trips w/o red snapper (lbs gw)	All species landings on Gulf trips (lbs gw)
2014	164	1,001	60,907	540,463	5,052	3,359,872	504,522
2015	25	31	4,832	46,857	958	468,358	244,482
2016	23	28	3,897	19,725	743	472,553	152,567
2017	163	1,138	75,895	266,338	4,526	2,679,207	414,802
2018	188	1,597	99,839	657,003	4,362	2,728,893	300,006
Average	113	759	49,074	306,077	3,128	1,941,777	323,276

Source: SEFSC-SSRG Socioeconomic Panel v.8.2 July 2019

Table 3.3.3. Number of vessels and ex-vessel revenue by year (2018 dollars) for South Atlantic red snapper, 2014-2018. Data for 2018 is incomplete.

Year	# of vessels that caught red snapper (> 0 lbs gw)	Dockside revenue from red snapper	Dockside revenue from 'other species' jointly caught w/ red snapper	Dockside revenue from 'other species' caught on South Atlantic trips w/o red snapper	Dockside revenue from 'all species' caught on Gulf trips	Total dockside revenue	Average total dockside revenue per vessel
2014	164	$335,397	$1,936,287	$10,384,761	$1,955,741	$14,612,186	$89,099
2015	25	$20,693	$185,527	$1,469,177	$974,815	$2,650,212	$106,008
2016	23	$16,907	$66,138	$1,484,923	$626,413	$2,194,381	$95,408
2017	163	$418,331	$839,701	$8,724,828	$1,097,955	$11,080,815	$67,980
2018	188	$556,134	$2,126,443	$7,968,123	$800,557	$11,451,257	$60,911
Avg	113	$269,492	$1,030,819	$6,006,362	$1,091,096	$8,397,770	$83,881

Source: SEFSC-SSRG Socioeconomic Panel v.8.2 July 2019

Imports

Imports of seafood products compete in the domestic seafood market and have in fact dominated many segments of the seafood market. Imports aid in determining the price for domestic seafood products and tend to set the price in the market segments in which they dominate. Seafood imports have downstream effects on the local fish market. At the harvest level for snapper species, including red snapper, imports affect the returns to fishermen through the ex-vessel prices they receive for their landings. As substitutes to domestic production of snappers, imports tend to cushion the adverse economic effects on consumers resulting from a reduction in domestic landings. The following describes the imports of fish products that directly compete with domestic harvest of snappers, including red snapper, and groupers.

Information on the imports of all snapper and grouper species, either fresh or frozen, are available at the NOAA website[3] Information on the imports of individual snapper or grouper species, including red snapper, is not available. In 2018, imports of all snapper and grouper species (fresh and frozen) were approximately 60.01 million pounds (mp) valued at approximately $191.16 million (2018 dollars). These amounts are contrasted with the harvest of snappers and groupers in the South Atlantic in 2017 of approximately 1.21 mp valued at approximately $4.57 million (2017 dollars; data available at the NOAA website[4]). Although the levels of domestic production and imports are not totally comparable for several reasons, including considerations of different product form such as fresh versus frozen, and possible product mislabeling, the difference in the magnitude of imports relative to the amount of

[3] https://www.st.nmfs.noaa.gov/commercial-fisheries/foreign-trade/applications/trade-by-product
[4] https://www.st.nmfs.noaa.gov/commercial-fisheries/publications/index.

domestic harvest is indicative of the dominance of imports in the domestic market. Final comparable data for more recent years are not currently available.

Business Activity

The commercial harvest and subsequent sales and consumption of fish generates business activity as fishermen expend funds to harvest the fish and consumers spend money on goods and services, such as red snapper purchased at a local fish market and served during restaurant visits. These expenditures spur additional business activity in the region(s) where the harvest and purchases are made, such as jobs in local fish markets, grocers, restaurants, and fishing supply establishments. In the absence of the availability of a given species for purchase, consumers would likely spend their money on substitute goods, such as other finfish or seafood products, and services, such as visits to different food service establishments. As a result, the analysis presented below represents a distributional analysis only; that is, it only shows how economic effects may be distributed through regional markets and should not be interpreted to represent the impacts if these species are not available for harvest or purchase.

Estimates of the U.S. average annual business activity associated with the commercial harvest of red snapper, and all species harvested by the vessels that harvested these red snapper, were derived using the model[5] developed for and applied in NMFS (2017) and are provided in **Table 3.3.4**. This business activity is characterized as jobs (full- and part-time), income impacts (wages, salaries, and self-employed income), output (sales) impacts (gross business sales), and value-added impacts, which represent the contribution made to the U.S. Gross Domestic Product (GDP). These impacts should not be added together because this would result in double counting. It should be noted that the results provided should be interpreted with caution and demonstrate the limitations of these types of assessments. These results are based on average relationships developed through the analysis of many fishing operations that harvest many different species. Separate models to address individual species are not available. For example, the results provided here apply to a general reef fish category rather than just red snapper, and a harvester job is "generated" for approximately every $33,000 (2018 dollars) in ex-vessel revenue. These results contrast with the number of harvesters (vessels) with recorded landings of red snapper presented in **Table 3.3.2**.

[5] A detailed description of the input/output model is provided in NMFS (2011).

Table 3.3.4. Average annual business activity (2014 - 2018) associated with the commercial harvest of red snapper and the harvest of all species by vessels that landed red snapper. All monetary estimates are in 2018 dollars.*

Species	Average Ex-vessel Value ($ thousands)	Total Jobs	Harvester Jobs	Output (Sales) Impacts ($ thousands)	Income Impacts ($ thousands)	Value Added ($ thousands)
Red snapper	$269	35	8	$2,673	$981	$1,387
All species harvested by vessels that landed red snapper.	$8,398	1,075	255	$83,279	$30,583	$43,210

Source: Calculated by NMFS SERO using the model developed for and applied in NMFS (2017).
*Converted to 2018 dollars using the annual, not seasonally adjusted GDP implicit price deflator (2009 base year) provided by the U.S. Bureau of Economic Analysis.

3.3.2 Economic Description of the Recreational Sector

The South Atlantic recreational sector is comprised of the private and for-hire modes. The private mode includes anglers fishing from shore (all land-based structures) and private/rental boats. The for-hire mode is composed of charter boats and headboats (also called partyboats). Charter boats generally carry fewer passengers and charge a fee on an entire vessel basis, whereas headboats carry more passengers and payment is per person. The type of service, from a vessel- or passenger-size perspective, affects the flexibility to search different fishing locations during the course of a trip and target different species since larger concentrations of fish are required to satisfy larger groups of anglers.

Angler Effort

Recreational effort derived from the Marine Recreational Information Program (MRIP) database can be characterized in terms of the number of trips as follows:

- Target effort - The number of individual angler trips, regardless of duration, where the intercepted angler indicated that the species or a species in the species group was targeted as either the first or the second primary target for the trip. The species did not have to be caught.
- Catch effort - The number of individual angler trips, regardless of duration and target intent, where the individual species or a species in the species group was caught. The fish did not have to be kept.
- Total recreational trips - The total estimated number of recreational trips in the South Atlantic, regardless of target intent or catch success.

A target trip may reveal an angler's preference for a certain species, and thus may carry more relevant information when assessing the economic effects of regulations on the subject species than the other two measures of recreational effort. The majority of red snapper target trips in the South Atlantic, as estimated by MRIP, were recorded in Florida on private vessels from 2014 through 2018 (**Table 3.3.5**). Estimates of red snapper target effort for additional years, and other measures of directed effort, are available online.[6]

During the short red snapper seasons that occurred in 2012, 2013, and 2014, both Florida and Georgia also collected some recreational effort data as part of their state-run survey programs.[7] Florida estimated the total number of private recreational boat trips that targeted red snapper and these estimates are incorporated herein by reference (Sauls et al. 2017). Direct comparison of these estimates to the MRIP estimates is not possible because MRIP data are recorded at the angler level rather than the vessel level. Georgia conducted telephone surveys of for-hire (charter vessel and headboat) captains to collect catch and effort data during the 2012-2014 recreational red snapper seasons and also administered a voluntary, private angler electronic catch survey during that time. These estimates are also incorporated herein by reference (Knowlton 2015). In 2014, the number of for-hire red snapper target trips recorded by Georgia was greater than what was estimated by MRIP, but the number of voluntarily reported private angler trips was significantly lower than the MRIP estimate (**Table 3.3.6**). North Carolina and South Carolina did not collect target red snapper effort data in 2012-2014.

[6] http://www.st.nmfs.noaa.gov/recreational-fisheries/access-data/run-a-data-query/queries/index.
[7] These survey programs were designed to maximize sampling opportunities during the mini-seasons.

Table 3.3.5. South Atlantic red snapper target trips, by mode and state, 2014-2018.*

	Florida	Georgia	North Carolina	South Carolina	Total
	Charter Mode				
2014	4,221	0	0	0	4,221
2015	0	0	0	0	0
2016	0	0	0	0	0
2017	3,981	0	0	0	3,981
2018	2,336	196	380	0	2,912
Average	2,108	39	76	0	2,223
	Private/Rental Mode				
2014	164,657	23,326	0	3,766	191,749
2015	2,117	0	0	0	2,117
2016	2,221	0	0	0	2,221
2017	133,547	0	0	0	133,547
2018	1,022,123	4,475	0	2,478	1,029,076
Average	264,933	5,560	0	1,249	271,742
	All Modes				
2014	168,878	23,326	0	3,766	195,970
2015	2,117	0	0	0	2,117
2016	2,221	0	0	0	2,221
2017	137,528	0	0	0	137,528
2018	1,024,459	4,671	380	2,478	1,031,988
Average	267,041	5,599	76	1,249	273,965

Source: MRIP database, SERO, NMFS.
*Headboat data are unavailable.

Table 3.3.6. Georgia estimates of angler trips that targeted red snapper, 2012-2014.

Year	For-hire (charter and headboat) angler trips*	Private angler trips
2012	100	31
2013	70	53
2014	312	120

Source: Knowlton (2015).
*There were 76, 47, and 180 charter angler trips targeting red snapper in 2012, 2013, and 2014, respectively.

Similar analysis of recreational angler trips (with the exception of the Georgia-based telephone survey) is not possible for the headboat mode because headboat data are not collected at the angler level. Estimates of effort by the headboat mode are provided in terms of angler

days, or the total number of standardized full-day angler trips.[8] Headboat effort in the South Atlantic, in terms of angler days, remained relatively steady in Florida through Georgia from 2014 through 2016, and then fell substantially in 2017 and 2018. A similar pattern occurred in North Carolina and South Carolina during this time period (**Table 3.3.7**). Headboat effort was the highest, on average, during the summer months of June through August (**Table 3.3.8**).

Table 3.3.7. South Atlantic headboat angler days and percent distribution by state, 2014-2018.

	Angler Days			Percent Distribution		
	FL/GA*	NC	SC	FL/GA	NC	SC
2014	195,890	20,547	42,025	75.79%	7.95%	16.26%
2015	194,979	22,691	39,702	75.76%	8.82%	15.43%
2016	196,660	22,716	42,207	75.18%	8.68%	16.14%
2017	126,126	20,170	36,914	68.84%	11.01%	20.15%
2018	120,560	16,813	37,611	68.90%	9.61%	21.49%
Average	166,843	20,587	39,692	72.89%	9.21%	17.89%

*East Florida and Georgia are combined for confidentiality purposes.
Source: NMFS Southeast Region Headboat Survey (SRHS).

Table 3.3.8. South Atlantic headboat angler days and percent distribution by month, 2014-2018.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Headboat Angler Days											
2014	8,748	13,512	19,808	22,570	25,764	39,115	44,066	32,886	15,203	15,235	9,088	14,611
2015	12,661	11,148	21,842	25,128	25,172	36,907	42,558	30,772	15,649	13,375	9,623	12,562
2016	9,818	12,243	23,872	22,217	27,374	37,454	45,744	29,223	17,061	9,202	12,820	13,404
2017	7,693	10,066	13,382	17,448	19,377	27,050	33,356	21,037	6,684	8,928	8,929	9,260
2018	4,428	9,862	14,080	15,167	13,264	29,038	30,235	26,233	9,715	8,072	7,673	7,217
Avg	8,670	11,366	18,597	20,506	22,190	33,913	39,192	28,030	12,862	10,962	9,627	11,411
	Percent Distribution											
2014	3%	5%	8%	9%	10%	15%	17%	13%	6%	6%	3%	6%
2015	5%	4%	8%	10%	10%	14%	17%	12%	6%	5%	4%	5%
2016	4%	5%	9%	9%	11%	14%	18%	11%	7%	4%	5%	5%
2017	4%	5%	7%	10%	11%	15%	18%	11%	4%	5%	5%	5%
2018	3%	6%	8%	9%	8%	17%	17%	15%	6%	5%	4%	4%
Avg	5%	6%	11%	12%	13%	19%	22%	16%	7%	6%	6%	7%

Source: NMFS Southeast Region Headboat Survey (SRHS).

[8] Headboat trip categories include half-, three-quarter-, full-, and 2-day trips. A full-day trip equals one angler day, a half-day trip equals .5 angler days, etc. Angler days are not standardized to an hourly measure of effort and actual trip durations may vary within each category.

Permits

For-hire vessels are required to have a for-hire snapper grouper permit to fish for or possess snapper grouper species in the South Atlantic EEZ. As of August 12, 2019, there were 1,801 valid for-hire snapper grouper permits. This sector operates as an open access fishery and not all permitted vessels are necessarily active in the fishery. Some vessel owners may have obtained open access permits as insurance for uncertainties in the fisheries in which they currently operate. The number of for-hire vessel permits issued for the South Atlantic snapper grouper fishery reached a five-year high of 2,176 permits in 2018 (**Table 3.3.9**). The majority of snapper grouper for-hire permitted vessels were home-ported in Florida; a relatively high proportion of these permitted vessels were also home-ported in North Carolina and South Carolina. Many vessels with South Atlantic for-hire snapper grouper permits were home-ported in states outside of the SAFMC's area of jurisdiction. On average (2014 through 2018), these vessels accounted for approximately 11% of the total number of for-hire snapper grouper permits issued.

Table 3.3.9. Number of South Atlantic for-hire snapper grouper permits, by homeport state, 2014-2018.

Home Port	2014	2015	2016	2017	2018	Average
North Carolina	294	308	331	367	371	340
South Carolina	160	188	212	217	236	206
Georgia	34	45	53	65	70	54
Florida	1,062	1,071	1,100	1,153	1,285	1,102
Gulf (AL-TX)	81	73	69	70	65	75
Others	96	94	102	142	149	134
Total	1,727	1,779	1,867	2,014	2,176	1,912

Source: NMFS SERO Permits Dataset, 2019.

Although the for-hire permit application collects information on the primary method of operation, the permit itself does not identify the permitted vessel as either a headboat or a charter vessel and vessels may operate in both capacities. However, only federally permitted headboats are required to submit harvest and effort information to the NMFS Southeast Region Headboat Survey (SRHS). Participation in the SRHS is based on determination by the Southeast Fishery Science Center (SEFSC) that the vessel primarily operates as a headboat. As of June 11, 2018, 64 South Atlantic headboats were registered in the SRHS (K. Fitzpatrick, NMFS SEFSC, pers. comm.). The majority of these headboats were located in Florida/Georgia (39), followed by North Carolina (14) and South Carolina (11).

There are no specific permitting requirements for recreational anglers to harvest snapper grouper species. Instead, anglers are required to possess either a state recreational fishing permit that authorizes saltwater fishing in general, or be registered in the federal National Saltwater Angler Registry system, subject to appropriate exemptions. As a result, it is not possible to identify with available data how many individual anglers would be expected to be affected by this proposed amendment.

Economic Value

Participation, effort, and harvest are indicators of the value of saltwater recreational fishing. However, a more specific indicator of value is the satisfaction that anglers experience over and above their costs of fishing. The monetary value of this satisfaction is referred to as consumer surplus (CS). The value or benefit derived from the recreational experience is dependent on several quality determinants, which include fish size, catch success rate, and the number of fish kept. These variables help determine the value of a fishing trip and influence total demand for recreational fishing trips. The estimated value of the CS for catching and keeping a second red snapper on an angler trip is approximately $84 (values updated to 2018 dollars[9]), and decreases thereafter (approximately $56 for a third red snapper, $42 for a fourth red snapper, and $32 for a fifth red snapper in 2018 dollars) (Carter and Liese 2012).

The foregoing estimates of economic value should not be confused with economic impacts associated with recreational fishing expenditures. Although expenditures for a specific good or service may represent a proxy or lower bound of value (a person would not logically pay more for something than it was worth to them), they do not represent the net value (benefits minus cost), nor the change in value associated with a change in the fishing experience.

With regards to for-hire businesses, economic value can be measured by producer surplus (PS) per passenger trip (the amount of money that a vessel owner earns in excess of the cost of providing the trip). Estimates of the PS per for-hire passenger trip are not available. Instead, net operating revenue (NOR), which is the return used to pay all labor wages, returns to capital, and owner profits, is used as a proxy for PS. The estimated NOR value for an average South Atlantic charter angler trip is $172 (2018 dollars) and the estimated NOR value for a South Atlantic headboat angler trip is $47 (2018 dollars) (C. Liese, NMFS SEFSC, pers. comm.). Estimates of NOR per red snapper target trip are not available.

Business Activity

The desire for recreational fishing generates economic activity as consumers spend their income on various goods and services needed for recreational fishing. This spurs economic activity in the region where recreational fishing occurs. It should be clearly noted that, in the absence of the opportunity to fish, the income would presumably be spent on other goods and services and these expenditures would similarly generate economic activity in the region where the expenditure occurs. As such, the analysis below represents a distributional analysis only.

Estimates of the business activity (economic impacts) associated with recreational angling for South Atlantic red snapper were calculated using average trip-level impact coefficients derived from the 2015 Fisheries Economics of the U.S. report (NMFS 2017) and underlying data provided by the National Oceanic and Atmospheric Administration (NOAA) Office of Science and Technology. Economic impact estimates in 2015 dollars were adjusted to 2018 dollars using

[9] Converted to 2018 dollars using the annual, not seasonally adjusted GDP implicit price deflator provided by the U.S. Bureau of Economic Analysis.

the annual, not seasonally adjusted GDP implicit price deflator provided by the U.S. Bureau of Economic Analysis.

Business activity (economic impacts) for the recreational sector is characterized in the form of jobs (full- and part-time), income impacts (wages, salaries, and self-employed income), output (sales) impacts (gross business sales), and value-added impacts (contribution to the GDP in a state or region). Estimates of the average annual economic impacts (2014-2018) resulting from South Atlantic red snapper target trips are provided in **Table 3.3.10**. These estimates are low due to the small number of estimated red snapper target trips that occurred during the mini-season in 2014 and during the subsequent closed seasons in 2015-2018. The average impact coefficients, or multipliers, used in the model are invariant to the "type" of effort and can therefore be directly used to measure the impact of other effort measures such as red snapper catch trips. To calculate the multipliers from **Table 3.3.10**, simply divide the desired impact measure (sales impact, value-added impact, income impact or employment) associated with a given state by the number of target trips for that state.

The estimates provided in **Table 3.3.10** only apply at the state-level. Addition of the state-level estimates to produce a regional (or national) total may underestimate the actual amount of total business activity, because state-level impact multipliers do not account for interstate and interregional trading. It is also important to note, that these economic impacts estimates are based on trip expenditures only and do not account for durable expenditures. Durable expenditures cannot be reasonably apportioned to individual species. As such, the estimates provided in **Table 3.3.10** may be considered a lower bound on the economic activity associated with those trips that targeted red snapper.

Estimates of the business activity associated with headboat effort are not available. Headboat vessels are not covered in MRIP, so, in addition to the absence of estimates of target effort, estimation of the appropriate business activity coefficients for headboat effort has not been conducted.

Table 3.3.10. Estimated annual average economic impacts (2014-2018) from South Atlantic recreational red snapper target trips, by state and mode, using state-level multipliers. All monetary estimates are in thousands, 2018 dollars.

	NC	SC	GA*	FL
	Charter Mode			
Target Trips	76	0	39	2,108
Value Added Impacts	$31	$0	$7	$485
Sales Impacts	$55	$0	$12	$814
Income Impacts	$18	$0	$4	$287
Employment (Jobs)	1	0	0	8
	Private/Rental Mode			
Target Trips	0	1,249	5,560	264,933
Value Added Impacts	0	$29	$135	$7,161
Sales Impacts	0	$44	$205	$10,684
Income Impacts	0	$13	$66	$3,538
Employment (Jobs)	0	1	3	105

Source: Effort data from MRIP; economic impact results calculated by NMFS SERO using NMFS (2017) and underlying data provided by the NOAA Office of Science and Technology.

3.4 Social Environment

This framework amendment affects commercial and recreational management of red snapper. This section provides the background for the proposed actions, which is evaluated in **Chapter 4**. Commercial and recreational landings by state are included to provide information on the geographic distribution of fishing involvement. Descriptions of the top communities involved in commercial red snapper are included along with the top recreational fishing communities based on recreational engagement. 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 and commercial red snapper fishery is provided in the Economic Environment in **Section 3.3**.

3.4.1 Landings by State

The South Atlantic red snapper season was closed in 2010, 2011, 2015, and 2016 and was open for a short season during 2012, 2013, 2014, 2017, and 2018. Landings by state for the years of 2017 and 2018 are described below because these data represent the most recent years that red snapper was open in federal waters.

Commercial

The majority of commercial red snapper landings came from waters adjacent to Florida (83.7% on average for years 2017 and 2018, SERO and SEFSC ACL Files), followed by North Carolina (9.9%) and South Carolina (6.3%). There were no commercial landings of red snapper in Georgia in 2017 and 2018. Total commercial landings were 15,337 fish in 2017 and 21,771 fish in 2018 (SERO and SEFSC ACL Files).

Recreational

The majority of recreational red snapper landings come from waters adjacent to Florida (95.7% on average for years 2017 and 2018), followed by South Carolina (2.1%), North Carolina (1.3%), and Georgia (0.9%). Total recreational landings were 14, 270 fish in 2017 and 38,572 fish in 2018. Recreational landings were derived from MRIP or red snapper state surveys done by the individual states of the South Atlantic region.

3.4.2 Fishing Communities

The descriptions of South Atlantic communities include information about the top communities based on a "regional quotient" (RQ) of commercial landings and value for red snapper. The RQ is the proportion of landings and value out of the total landings and value of that species for that region, and is a relative measure. These communities would be most likely to experience the effects of the proposed actions that could change the red snapper fishery and impact participants, associated businesses, and communities within the region. If a community is identified as a red snapper community based on the RQ, this does not necessarily mean that the community would experience significant impacts due to changes in the fishery if a different species or number of species was also important to the local community and economy. Additional detailed information about communities with the highest RQs can be found for South Atlantic communities at the Southeast Regional Office's Community Snapshots website.[10]

In addition to examining the RQs to understand how communities are engaged on fishing, indices were created using secondary data from permit and landings information for the commercial sector (Jacob et al. 2013; Jepson and Colburn 2013). Fishing engagement is primarily the absolute numbers of permits, landings, and value for all species. For commercial fishing, the analysis used the number of vessels designated commercial by homeport and owner address, value of landings, and total number of commercial permits for each community for all species.

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 of engagement were plotted for the communities with the highest RQs. Two thresholds of one and one-half standard deviation above the mean are plotted to help determine a threshold for significance. The factor

[10] https://www.fisheries.noaa.gov/southeast/socioeconomics/snapshots-human-communities-and-fisheries-gulf-mexico-and-south-atlantic

scores are standardized; therefore, a score above a value of 1.0 is also above one standard deviation. A score above one-half standard deviation is considered engaged with anything above one standard deviation to be very engaged. The reliance index uses factor scores that are normalized. The factor score is similar to a z-score in that the mean is always zero, positive scores are above the mean, and negative scores are below the mean. Comparisons between scores are relative; however, like a z-score, the factor score puts the community on a point in the distribution. Objectively, that community will have a score related to the percent of communities with similar attributes. For example, a score of 2.0 means the community is two standard deviations above the mean and is among the 2.27% most vulnerable places in the study (normal distribution curve).

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 red snapper. 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 (Jacob et al. 2013; Jepson and Colburn 2013). Recreational fishing engagement is represented by the number of recreational permits and vessels designated as "recreational" by homeport and owners address. Fishing reliance includes the same variables as fishing engagement, divided by population. Factor scores of both engagement and reliance were plotted. **Figure 3.4.3** identifies the top communities that are engaged and reliant upon recreational fishing in general.

A description of the social environment, including analysis of communities engaged in red snapper fishing, was provided in Amendment 43 for snapper grouper (SAFMC 2018) and is incorporated herein by reference. The referenced description focuses on available geographic and demographic data to identify top commercial red snapper communities using 2014 Accumulated Landings System (ALS) data and engagement, reliance, and social vulnerability indicators from 2014. This section has been updated using 2017 ALS data and 2016 community social vulnerability indicators data, the most recent year available.

Commercial Fishing Communities

Figure 3.4.1 includes the top red snapper communities by regional quotient landings and value during 2017. The majority of the top red snapper communities are located in Florida with one of the top communities located in North Carolina. About 50% of red snapper is landed in the top three communities (Sanford, Cocoa, and Port Orange, Florida), representing about 48% of the South Atlantic-wide ex-vessel value for the species. The remaining top communities collectively represent about 39% of South Atlantic red snapper landings and 40% of ex-vessel value.

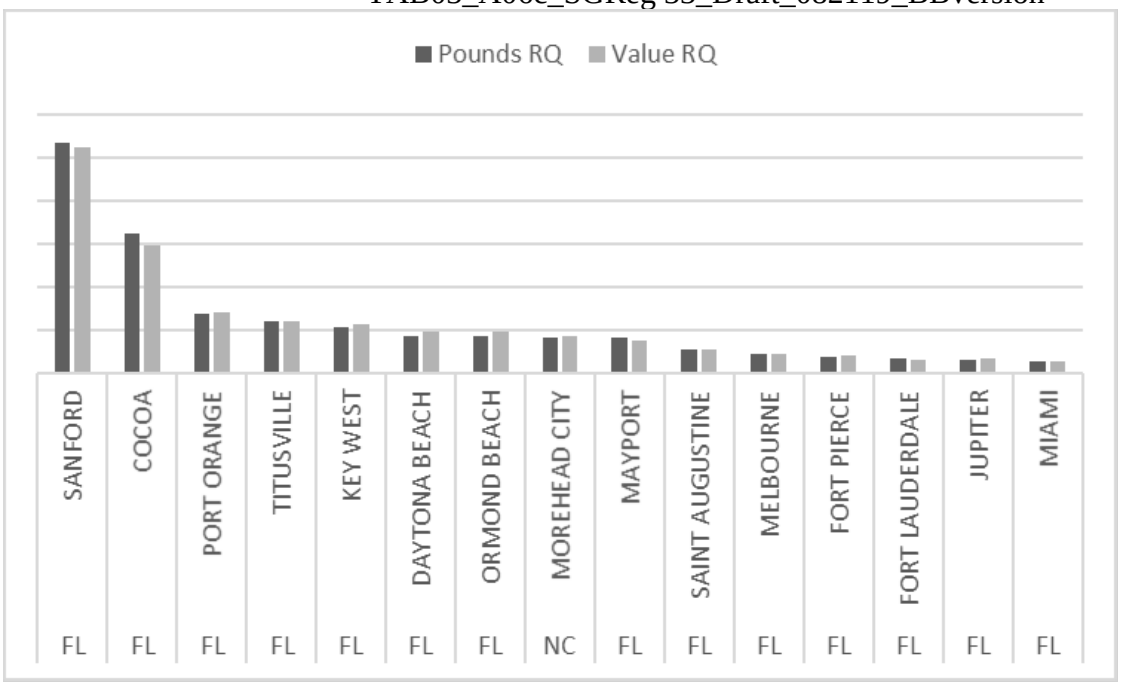


Figure 3.4.1. Top South Atlantic communities ranked by pounds and value regional of quotient (RQ) of red snapper. The actual RQ values (y-axis) are omitted from the figure to maintain confidentiality. Source: SERO, Community ALS 2017.

The commercial engagement indices of the top commercial red snapper communities are included in **Figure 3.4.2**. The details of how these indices are generated are explained at the beginning of the Fishing Communities section. Two thresholds of one and one-half standard deviation above the mean were plotted to help determine a threshold for significance. The primary communities that demonstrate high levels of commercial fishing engagement include Port Orange, Key West, Mayport, Saint Augustine, Fort Pierce, Fort Lauderdale, Jupiter, and Miami, Florida and Morehead City, North Carolina.

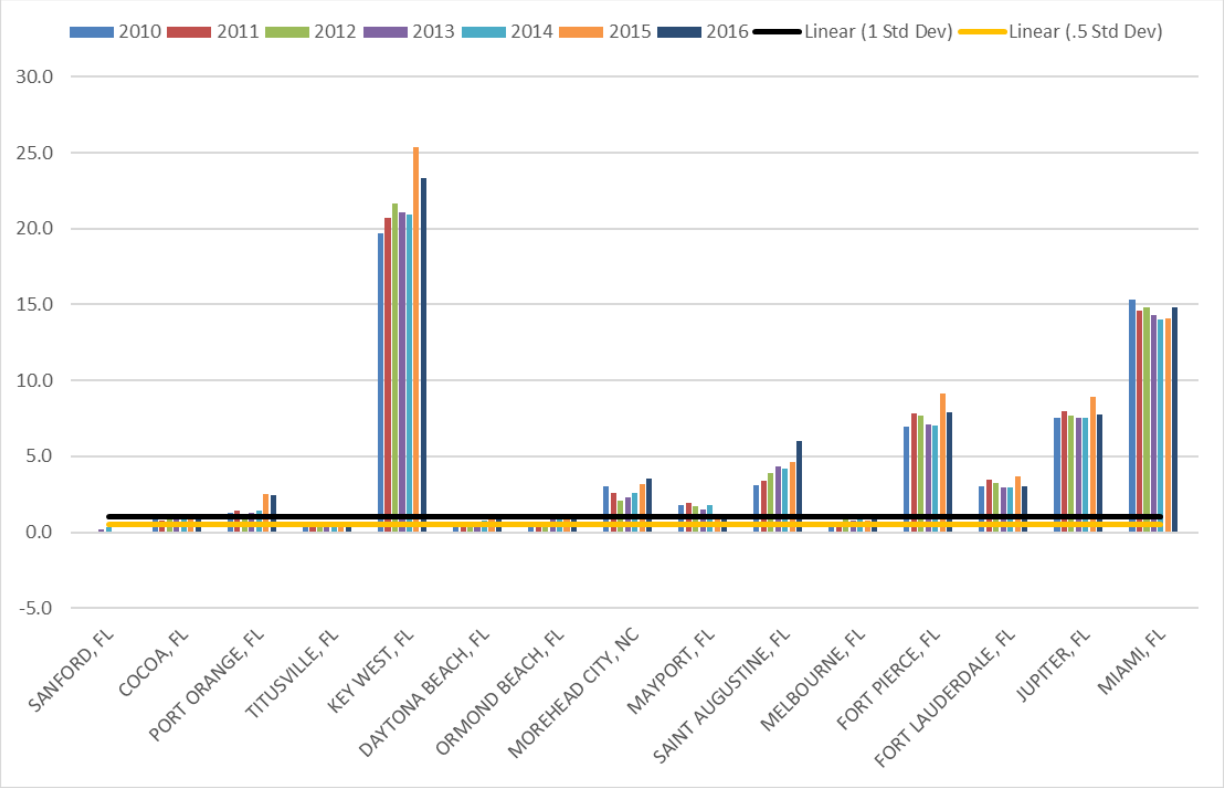


Figure 3.4.2. Top South Atlantic red snapper communities' commercial engagement, 2010-2016. Source: SERO, Community Social Vulnerability Indicators Database 2018 (American Community Survey 2012-2016).

Recreational Fishing Communities

Figure 3.4.3 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.

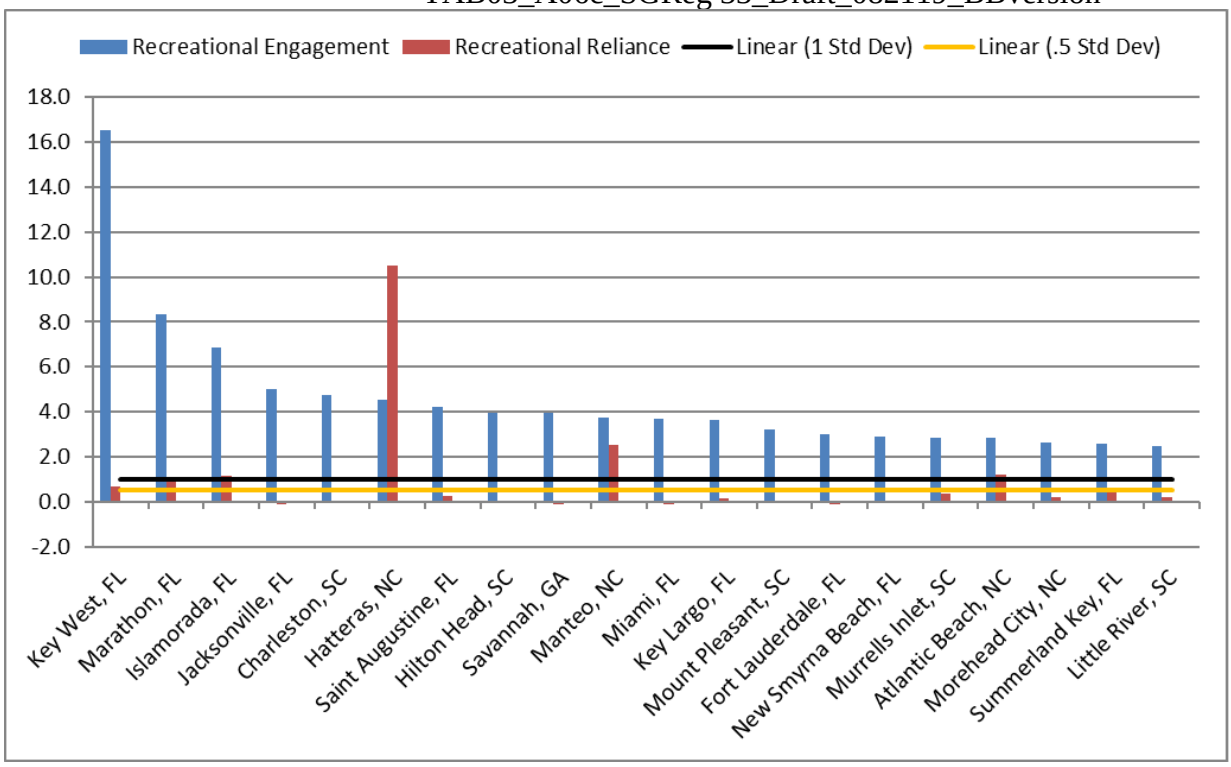


Figure 3.4.3. Top 20 recreational fishing communities' engagement and reliance.
Source: SERO, Community Social Vulnerability Indicators Database 2018 (American Community Survey 2012-2016).

3.4.3 Environmental Justice Considerations

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).

Commercial and recreational fishermen 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 (individual fishermen and crew) 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 and those involved in the industries and activities, themselves. To help assess whether any environmental justice concerns arise from the actions in this amendment, a suite of indices were created to examine the social

vulnerability of coastal communities. These indices rely on data from the U.S. Census ACS 2012 through 2016 five-year estimates. 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 3.4.4 and **Figure 3.4.5** provide the social vulnerability of the top commercial and recreational communities. Several South Atlantic communities exceed the threshold of one-half standard deviation for at least one of the social vulnerability indices: Cocoa, Daytona Beach, Fort Lauderdale, Fort Pierce, Marathon, and Miami, Florida; Savannah, Georgia; and Morehead City, North Carolina. The communities of Cocoa, Florida; Fort Pierce, Florida; 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.

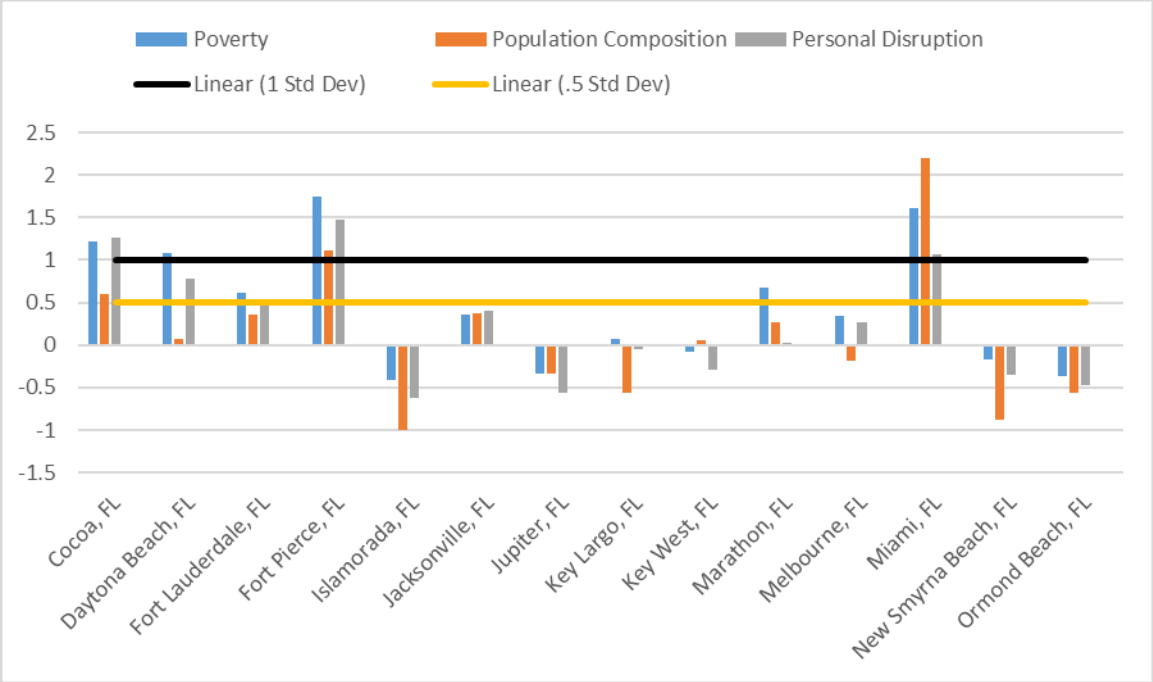


Figure 3.4.4. Social vulnerability indices for top commercial and recreational communities. Source: SERO, Community Social Vulnerability Indicators Database 2018 (American Community Survey 2012-2016).

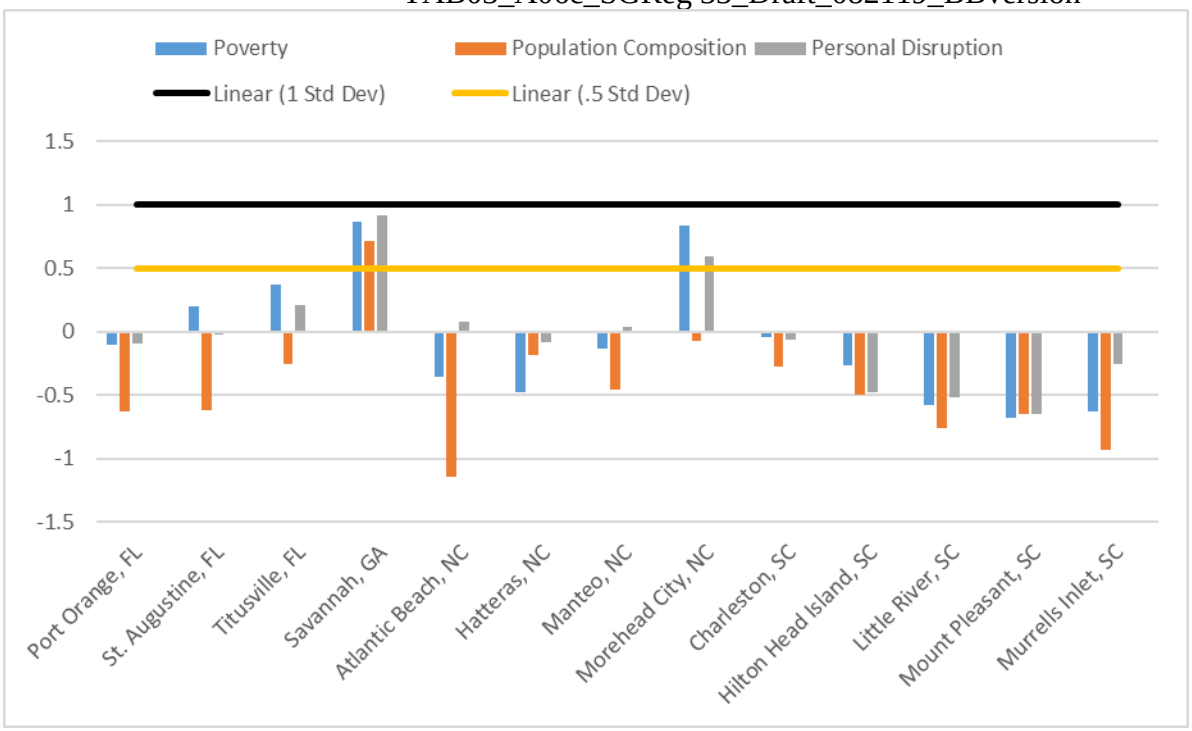


Figure 3.4.5. Social vulnerability indices for top commercial and recreational communities continued. Source: SERO, Community Social Vulnerability Indicators Database 2018 (American Community Survey 2012-2016).

People in these communities may be affected by fishing regulations in two ways: participation 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 red snapper specifically (participation). Although no EJ issues have been identified, the absence of potential EJ concerns cannot be assumed.

3.5 Administrative Environment

3.5.1. Federal Fishery Management

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

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

The 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 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 Council has adopted procedures whereby the non-voting members serving on the Council Committees have full voting rights at the Committee level but not at the full South Atlantic Council level. The Council also established two voting seats for the Mid-Atlantic Council on the South Atlantic Mackerel Committee. 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 Council uses its 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.

3.5.2 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 Council. The purpose of state representation at the 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 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 Council level, but does not have voting authority at the 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.

3.5.3 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 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 Effects and Comparison of Alternatives

4.1 Action 1. Remove the minimum number of days for the South Atlantic red snapper seasons

4.1.1 Biological Effects

Expected Effects to Snapper Grouper Species

The proposed action is expected to result in neither positive nor negative biological effects to the South Atlantic red snapper stock relative to **Alternative 1 (No Action)** since overall harvest would continue to be limited to the annual catch limit (ACL).

The actions in this framework amendment are not expected to negatively impact snapper grouper essential fish habitat (EFH). Fishing effort is not expected to significantly increase as a result of this action, nor are changes in fishing techniques or behavior expected that would affect EFH.

Expected Effects to Protected Species

The actions in this framework amendment are not expected to have an impact on protected species.

Alternatives*

1 (No Action). If the projected commercial or recreational fishing season is determined by the National Marine Fisheries Service to be three days or less, then the commercial or recreational fishing season will not open for that fishing year.

2. Remove the requirement specifying the red snapper recreational and commercial seasons in the South Atlantic would not open if projections indicate the season would be three days or fewer.

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

4.1.2 Economic Effects

The potential economic effects of **Action 1** are highly dependent upon the projected length of the red snapper fishing season. Under circumstances where the projected red snapper fishing season is determined to be more than three days, there would be no difference in the economic effects of **Alternative 2** in comparison to **Alternative 1 (No Action)** because the length of the fishing season would be the same between the two alternatives and overall harvest would continue to be limited to the ACL. Since the commercial season for red snapper has remained opened for several months in recent years when harvest of red snapper was allowed, it is reasonable to expect that the commercial season will continue to open in the forseeable future and there are no expected direct or indirect economic effects from **Action 1** for the commercial sector.

For the recreational sector, the season for red snapper has remained open for approximately 5 to 6 days when harvest of red snapper was allowed; therefore, if this trend continues, there would

be no expected direct or indirect economic effects from **Action 1** for the recreational sector as well. However, should recreational landings of red snapper increase, it is possible that projections could indicate a season of less than three days for that sector. If the projected recreational fishing season is determined to be three or fewer days, **Alternative 1 (No Action)** would result in forgone short-term economic benefits. In this scenario, **Alternative 2** would still allow the recreational red snapper season to occur. This would provide economic benefits through increased consumer surplus (CS) for recreational anglers, increased revenue for for-hire (charter and headboat) businesses, and increased business activity for recreational fishing related businesses.

The anticipated change in recreational CS for **Alternative 2** in comparison to **Alternative 1 (No Action)** under the scenarios of projected red snapper seasons of more than three days and three or fewer days is provided in **Table 4.2.1**. If the fishing season is opened for red snapper, it is assumed that the recreational sector will harvest its ACL (recreational ACL=29,656 fish). Overall, for **Action 1** it is estimated that CS would increase between $0 and approximately $2,491,000 (2018 dollars).

Table 4.2.1. Estimated change in recreational consumer surplus (CS) under **Alternative 2** of **Action 1** relative to the status quo (**current regulations**).

	Projected length of the recreational season	
	If the season is greater than three days	**If the season is three days or less**
Estimated change in recreational landings (number of fish)	0	29,656
Estimated change in consumer surplus (2018 dollars)*	$0	$2,491,104

*Assumes a CS value of $84 (2018 dollars) per red snapper (Carter and Liese 2012).

Should **Alternative 2** allow for recreational red snapper harvest that otherwise would not occur, there is the potential that angler demand for for-hire trips would increase as well, resulting in increased booking rates and for-hire 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.[11] As such, no estimates of the change in for-hire NOR are provided, although they may exist.

Additionally, recreational fishing for red snapper spurs business activity in the region in which it occurs. If **Alternative 2** allows a recreational season for red snapper when it would have not occurred otherwise, it may be reasonably expected to increase such business activity relative to the status quo, by increasing recreational expenditures on goods and services

[11] 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.

necessary for fishing. These potential economic benefits cannot be quantified with available data.

4.1.3 Social Effects

Alternative 1 (No Action) would retain current regulations, which do not allow any harvest if the fishing season for the red snapper commercial or recreational sector is determined to be three days or less. Such action would likely be perceived negatively by stakeholders in both the commercial and recreational sectors as much of the public comment suggested that past closures have resulted in negative social and economic impacts. However, under **Alternative 2** the limited fishing opportunity provided by such a small season could result in the development of derby fishing where many vessels are pursuing red snapper at the same time. This can place vessels in direct competition or force some fishermen to fish in weather conditions that are dangerous, especially depending on the timing of the opening as discussed in Action 2. However, allowing for the harvest of red snapper in South Atlantic waters, regardless of season length, is likely to have positive social effects, as the past closures of this portion of the snapper grouper fishery have been highly controversial.

4.1.4 Administrative Effects

If the recreational red snapper fishing season is predicted to be more than three days, **Alternative 1 (No Action)** or **Alternative 2** would not create additional administrative effects. Under **Alternative 1 (No Action)**, if the recreational red snapper fishing season is predicted to be less than three days, not specifying a short fishing season would reduce administrative effects to the National Marine Fisheries Service (NMFS), the Council, and the states. However, if the recreational red snapper fishing season is predicted to be less than three days, **Alternative 2** would include the administrative burden of data monitoring, outreach, and enforcement of a short fishing season. Therefore, for each scenario, the administrative effects would be least under **Alternative 1 (No Action)** when compared with **Alternative 2**.

4.2 Action 2. Modify the start date for the recreational red snapper season

4.2.1 Biological Effects

The red snapper spawning season in the South Atlantic takes place from April through October with peaks in June through August (SEDAR 41 2017). **Alternatives 2-5** would result in similar biological effects relative to the current start date (second Friday in July) since harvest would continue to occur when red snapper are spawning. Under current regulations, anglers in the South Atlantic region are catching and releasing red snapper outside of the open season; approximately 28% of those fish do not survive (SEDAR 41 2017). Therefore, allowing limited harvest during a portion of the red snapper spawning season would likely not have measurable positive or negative biological impacts to the stock relative to **Alternative 1 (No Action)** as harvest would continue to be limited to the recreational ACL.

Alternatives*

1 (No Action). The recreational season, which consists of weekends only (Fridays, Saturdays, and Sundays) begins on the second Friday in July, unless otherwise specified.

2. Modify the recreational season to start in May.
   - 2a. First week
   - 2b. Second week
   - 2c. Third week
   - 2d. Fourth week

3. Modify the recreational season to start in June.
   - 3a. First week
   - 3b. Second week
   - 3c. Third week
   - 3d. Fourth week

4. Modify the recreational season to start in September.
   - 4a. First week
   - 4b. Second week
   - 4c. Third week
   - 4d. Fourth week

5. Modify the recreational season to start on May 1 for a portion of projected season and resume harvest in XXXX.

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

4.2.2 Economic Effects

The economic effects of **Action 2** would likely be similar across all of the alternatives (**Alternative 1 (No Action)** and **Alternatives 2-5**). The length of the fishing season (i.e. the number of days that red snapper can be recreationally harvested) would presumably be the same between the alternatives and overall harvest would continue to be limited to the recreational annual catch limit. Additionally, since there are no anticipated measurable positive or negative biological impacts, there would not be economic effects resulting from future variations to harvest levels that would be an outcome of changes in the red snapper stock. As such measures of recreational consumer surplus and for-hire net operating revenue would be the same and there would not be different economic effects between the alternatives.

4.2.3 Social Effects

The recreational season start date under **Alternative 1 (No Action)** and those proposed under **Alternatives 2-4** and their associated sub-alternatives should all provide for positive social effects by allowing some fishing opportunities for red snapper. However, the alternative that offers the most positive social effects may depend on where a stakeholder resides regarding a preferred opening date. Seasonal weather patterns vary along the South Atlantic coast and can affect recreational fishing activity, especially for fishermen that require longer travel times to productive fishing grounds or participate in the red snapper portion of the snapper grouper fishery using smaller vessels. Season opening dates for red snapper that decrease the chance of inclement weather throughout the South Atlantic overall would result in the greatest social benefits because they would allow equitable access to the greatest number of fishermen in addition generating revenue for charter/headboat businesses. Information from the National Bouy Data Center indicates from June to August (**Alternative 1 (No Action)** and **Alternative 3**) typically 10 to 20 percent of the days will have maximum winds reaching 20 knots or greater (small craft advisory conditions) in all locations (North Carolina, South Carolina, and Florida). Outside of those months (**Alternative 2** and **Alternative 4**), the occurrence of winds meeting small craft advisory conditions increases to 50% (**Appendix I**).

Opening dates earlier in the year, as proposed in **Alternative 2** and **Alternative 3**, would ensure that, should a reopening of the red snapper recreational sector be necessary, it would occur early enough in the year to decrease the chance of inclement weather negatively affecting fishing opportunities. Providing for a reopening, if necessary, would help to ensure that the full ACL is harvested and the associated social effects -- increased fishing opportunities, revenue generated for charter/headboat businesses, and fewer discards -- are realized.

Under **Alternative 5** harvest of red snapper could open in both the spring and the fall, allowing access to the fishery and ensuring associated social benefits are experienced throughout the South Atlantic region. However, should the entire recreational ACL be harvested during the spring opening, a fall opening would not occur. This would result in areas that have easier access to red snapper in the spring and/or do not experience inclement weather events during the spring opening to receive greater social benefits than other areas of the South Atlantic. The lack of predictability regarding whether a fall season would be occur may be challenging for recreational fishermen, particularly the charter/headboat industry that must schedule trips in advance around known season closures.

4.2.4 Administrative Effects

Administrative impacts associated with this action are primarily associated with data monitoring, outreach, and enforcement. There are administrative effects to NMFS, the Council, and the states from monitoring the ACL, implementing rule-making, enforcing regulations, and announcing openings and closings through outreach efforts.

Season Projection and Data Monitoring

The recreational fishing season is currently determined by NMFS based on estimated red snapper catches from the previous year and the estimated catch rates. Data needed for season

projections are generally available by March of the following year. The South Atlantic states conduct dockside sampling during the limited red snapper recreational fishing seasons to estimate charter vessel and private angler catches. This approach was utilized during the 2017, 2018, and 2019 seasons. The Marine Recreational Information Program (MRIP) and the headboat survey are used to monitor recreational landings.

Alternative 1 (No Action) would continue the moderate adverse, administrative effects to NMFS and the states incurred by the season projection and data monitoring approaches summarized above in addition to associated burdens from enforcement, education, and outreach.

Alternatives 2 and **3** would alter the timing of the seasons. A May (**Alternative 2**) or June (**Alternative 3**) opening would cause adverse administrative effects to NMFS compared to the status quo due to the short time between when data are available from the previous year (March) and the season opening (May or June). Additionally, moving the season earlier in the year could negatively impact the states' ability to accurately mornitor catches of red snapper. The state of Florida is also responsible for an extensive dockside sampling effort for the Gulf of Mexico recreational red snapper fishing season. The Gulf of Mexico season usually begins in June and does not currently overlap with the South Atlantic season. It may not be possible for the state of Florida to provide adequate dockside samplers if the season were to overlap. This may also impact the ability of survey programs (i.e., MRIP) to monitor catches of other species during limited red snapper openings.

Alternative 4 would result in similar administrative effects compared to **Alternative 1 (No Action)**, but result in less impacts than **Alternative 2** or **Alternative 3**. A fishing season in September would give NMFS and the states a longer time to prepare data monitoring efforts.

Alternative 5 would cause the most administrative burden to NMFS and the states. As under **Alternative 2**, a May opening would not allow sufficient time for NMFS to project the length of the season and would be difficult for the states to accurately sample the fishing season. In addition, NMFS would have to again determine whether the entire ACL was harvested during the initial opening to project a possible second opening in the fall. Given that currently NMFS does not obtain data to project the red snapper season until approximately 6 months after the season, it is reasonable to assume there would not be sufficient information for the agency to project a second opening without a substantial effort from state sampling programs. Furthermore, under **Alternative 5**, the states would potentially incur the additional burden of a second red snapper season during which intensive sampling would have to take place.

Outreach and Education

The opening(s) of recreational red snapper harvest would be published in the *Federal Register* and would be communicated to interested parties via Fishery Bulletin, website updates, Twitter, and NOAA Weather Radio updates. Fishery managers would use all tools available to reach out to constituents in those circumstances including the use of NOAA Weather Radio, Twitter, Facebook, and Webpage updates. **Alternative 5** would likely result in the greatest administrative burden to NMFS and the states in terms of outreach and education relative to **Alternative 1 (No Action)** since there could potentially be two annual openings instead of one.

The greatest administrative effects overall would be caused by **Alternative 5**, followed by **Alternative 3**, **Alternative 2**, **Alternative 1 (No Action)**, and **Alternative 4**.

4.3 Action 3. Revise the days of the week recreational harvest of red snapper would be allowed during an open season

4.3.1 Biological Effects

The proposed action is expected to result in similar biological effects to the South Atlantic red snapper stock relative to current requirements since overall harvest would continue to be limited to the ACL.

4.3.2 Economic Effects

The economic effects of **Action 3** would likely be similar across all of the alternatives (**Alternative 1 (No Action)** and **Alternatives 2-8**). The length of the fishing season (i.e. the number of days that red snapper can be recreationally harvested) would presumably be the same between the alternatives and overall harvest would continue to be limited to the recreational ACL. As such measures of recreational consumer surplus and for-hire net operating revenue would be the same and there would not be different economic effects among the alternatives.

4.3.3 Social Effects

The recreational season that results in the greatest number of participants is anticipated to result in the largest positive social effects to fishing communities in the South Atlantic in the form of increased fishing opportunities, and revenue for charter/headboat and retail businesses. The majority of private recreational fishermen (though not all) are assumed to work a Monday through Friday schedule with time off work on Saturdays and Sundays (**Alternative 1 (No Action)** **Alternative 4**, **Alternative 5**, **Alternative 6**, and **Alternative 7**). As such, a recreational

Alternatives*

1 (No Action). If NMFS determines that recreational harvest of red snapper is allowed in a given fishing year, the recreational season consists of weekends only (Fridays, Saturdays, and Sundays).

2. When a red snapper recreational season is projected to take place harvest would be allowed on consecutive Mondays.

3. When a red snapper recreational season is projected to take place, harvest would be allowed on consecutive Fridays.

4. When a red snapper recreational season is projected to take place, harvest would be allowed on consecutive Saturdays.

5. When a red snapper recreational season is projected to take place, harvest would be allowed on consecutive Sundays.

6. When a red snapper recreational season is projected to take place, and depending on the projected numbers of days, harvest would be allowed every other weekend.
- 6a. Weekend = Fridays and Saturdays
- 6b. Weekend = Saturdays and Sundays
- 6c. Weekend = Fridays, Saturdays, and Sundays

7. When a red snapper recreational season is projected to take place, and depending on the projected number of days, harvest would be allowed the last weekend of each month.
- 7a. Weekend = Fridays and Saturdays
- 7b. Weekend = Saturdays and Sundays
- 7c. Weekend = Fridays, Saturdays, and Sundays

8. When a red snapper recreational season is projected to take place, the NMFS will present the season length to the Council at the annual March meeting, if the analysis and data are available, and the Council will provide recommendations on what dates they want open. The NMFS will announce the opening of the fishing season through the Federal Register and other methods deemed appropriate. The end of the recreational red snapper season will be pre-determined and announced before the start of the recreational season. The open days do not need to be consecutive.

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

red snapper season that allows participation on Saturdays and Sundays is anticipated to result in the greatest level of participation. Additionally, Mondays and Fridays (**Alternative 2** and **Alternative 3**) are anticipated to have slightly higher participation than the days in the middle of the week because Mondays and Fridays directly precede or follow a weekend.

Alternative 4 and **Alternative 5** would spread the number of allowable fishing days out by allowing harvest over consecutive weekends or once a month, respectively. These alternatives may help ensure that inclement weather does not prevent fishermen from harvesting red snapper for the entire available season. Additionally, the alternatives would spread out the revenue received by charter/headboat and associated businesses to a larger portion of the year. **Alternative 8**, which would allow fishery managers to decide the structure of the fishing season in March of each year, may provide the most flexibility. While **Alternative 8** would not allow more fishing days than permissible given the current ACL, it may allow managers to alter the season structure on a yearly basis based on changing needs of the red snapper portion of the snapper grouper fishery. Management that allows fishery managers to react quickly to changing needs and enact more appropriate regulations are more likely to result in positive social effects to fishing communities. **Alternative 8** could result in negative social effects to the charter/headboat industry as the alternative would reduce the predictability of the recreational fishing season. The fishing season would not be announced until some time after the March South Atlantic Fishery Management Council meeting. Charter businesses and customers likely will want to plan trips well in advance of the fishing season.

4.3.4 Administrative Effects

Administrative impacts associated with this action are similar to those outlined in Action 2 and are primarily associated with data monitoring, outreach, and enforcement. There are administrative effects to NMFS, the Council, and the states from monitoring the ACL, implementing rule-making, enforcing regulations, and announcing openings and closings through outreach efforts.

Season Projection and Data Monitoring

The recreational fishing season is currently determined by NMFS based on estimated red snapper catches from the previous year and the estimated catch rates. Data needed for season projections are generally available by March of the following year. The South Atlantic states conduct dockside sampling during the limited red snapper recreational fishing seasons to estimate charter vessel and private angler catches. This approach was utilized during the 2017, 2018, and 2019 seasons. The Marine Recreational Information Program (MRIP) and the headboat survey are used to monitor recreational landings.

Alternative 1 (No Action) would continue the moderate adverse, administrative effects. The fishing season would begin on the second Friday in July and would consist of weekends only.

Alternatives 2 through **5** would change the allowable fishing days to consecutive Mondays, Fridays, Saturdays, and Sundays, respectively. The Council could choose multiple prefererred alternatives to specify the season. These alternatives, as well as **Alternatives 6** and **7** and their

associated sub-alternatives, would have similar administrative effects as **Alternative 1 (No Action)** since the length of the red snapper season would not change and the same level of enforcement, education, and outreach as under **Alternative 1 (No Action)** would be expected. It is not known how spreading out the fishing season over multiple weekends/months would impact the states' ability to accurately mornitor catches of red snapper.

Alternative 8 would cause the most administrative burden to NMFS and the states as there are many potential options for structuring the season. Because of this, NMFS would have to put out notice and comment for rulemaking each year. Yearly comment and rule-making would result in major administrative burden to NMFS. Whether data would be available in March every year is not known. This could pose issues with projecting season length and giving the states adequate time to set up sampling program.

Outreach and Education

The announcement of the ACL and fishery openings would be published in the *Federal Register* and would be communicated to interested parties via Fishery Bulletin, website updates, Twitter, and NOAA Weather Radio updates. Fishery managers would use all tools available to reach out to constituents in those circumstances including the use of NOAA Weather Radio, Twitter, Facebook, and Webpage updates. **Alternative 8** would require the most stakeholder outreach and would result in the most administrative burden.

The greatest administrative effects would be caused by **Alternative 8**, followed by similar effects from **Alternative 1 (No Action)** to **Alternative 7**.

4.4 Action 4. Modify the ~~start date for the~~ red snapper commercial season

> ***Alternatives****
>
> 1 (No Action). The commercial red snapper season begins on the second Monday in July.
>
> 2. Modify the commercial season start date to the second Monday in May.
>
> 3. Modify the commercial season start date to the second Monday in June.
>
> 4. Modify the commercial season start date to May 1. Commercial harvest would not be allowed during July and August.
>
> ***Preferred indicated in bold. Refer to Chapter 2 for detailed language of alternatives

4.4.1 Biological Effects

The proposed action is expected to result in similar biological effects to the South Atlantic red snapper stock relative to **Alternative 1 (No Action)** since overall harvest would continue to be limited to the ACL. Red snapper in the South Atlantic spawn from April through October with peaks in June through August (SEDAR 41 2017); hence, all the proposed alternatives would allow commercial harvest during the spawning season. Under current regulations, red snapper that are caught incidentally to commercial fishing outside of the open season are discarded and approximately 38% of those fish do not survive (SEDAR 41 2017). Therefore, allowing harvest during a portion of the red snapper spawning season would likely not have measurable positive or negative biological impacts relative to **Alternative 1 (No Action)** as harvest would continue to be limited to the commercial ACL.

4.4.2 Economic Effects

The economic effects of **Action 4** would likely be similar across all of the alternatives (**Alternative 1 (No Action)** and **Alternatives 2-4**). The commercial harvest would continue to be limited to the commercial annual catch limit. Additionally, since there are no anticpated measurable positive or negative biological impacts, there would not be economic effects resulting from future variations to harvest levels that would be an outcome of changes in the red snapper stock. As such measures of commercial operating revenue would be the same and there would not be different economic effects among the alternatives.

4.4.3 Social Effects

The commercial season start date in **Alternative 1 (No Action)** and proposed **Alternatives 2-4** are all anticipated to provide social benefits by allowing commercial fishermen to keep red snapper that would have otherwise been discarded. However, the alternative that offers the most positive social effects may depend on where a stakeholder resides with regard to a preferred opening date. Comments from stakeholders indicate that the commercial sector does not target red snapper, but fishermen do retain them as incidental catch when targeting other snapper grouper species. If this is true, aligning the season opening for red snapper with the seasons for

other snapper grouper species is likely to provide the greatest social benefits to fishing communities. Alternatively, if commercial fishermen are making trips targeting red snapper, fishing communities may benefit from having access to the red snapper portion of the snapper grouper fishery and associated revenue at a time when other snapper grouper species are unavailable.

Considering spawning season closures and ACL closures over the last seven years, the months of May, June, and July (**Alternative 2**, **Alternative 3**, and **Alternative 1 (No Action)**, respectively) consistently have the most other snapper grouper species open to harvest. **Alternative 2** would align the red snapper opening with the season opening for the shallow water grouper species, which experiences a spawning season closure from January 1 through April 30. Additionally, **Alternative 2** would provide the longest season allowing as much time as possible for the commercial sector to harvest the total ACL and experience the associated social benefits. Assuming current commercial harvest rates remain the same and the commercial ACL was not reached prior to September, **Alternative 4** would allow harvest in both the spring and the fall months. This may help to extend commercial harvest longer than under **Alternative 1 (No Action)**, **Alternative 2**, and **Alternative 3**. In general, extending commercial harvest into the fall months would be most beneficial for fishermen targeting other species in the spring or operating in areas that experience inclement weather early in the year, because it would ensure that a portion of the commercial ACL would still be available in the fall.

4.4.4 Administrative Effects

None of the considered alternatives would change the administrative environment from its current condition. Currently, there is a commercial quota monitoring system in place for red snapper that is utilized to monitor landings against the commercial ACL. In each of the last two years, red snapper commercial harvest has closed early due to landings reaching the ACL prior to the end of the fishing year. If total effort for red snapper remains consistent, it is likely the ACL would be reached prior to the end of the fishing year. Therefore, NMFS would have to continue to prepare and issue closure notices and enforcement personnel would have to continue to monitor the closures. The timing of closure package preparation would be the only difference in effects for **Alternatives 2** through **4**. Also, with an in-season quota closure, there is potential for landings not to reach 100% of the ACL. In that circumstance, guidance from the Council to NMFS has recommended that harvest for snapper grouper species should reopen if landings are less than 95% of the ACL, and the projected number of days to meet the ACL is two or more days. Therefore, NMFS would have to monitor the landings and prepare a reopening notice.

Outreach materials for in-season actions would take the form of fishery bulletins and updates to NMFS Southeast Regional Office's web site.

Chapter 5. South Atlantic Council's Rationale for the Preferred Alternatives

5.1 Action 1.

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

*Alternatives***

5.1.4 Public Comments and Recommendations

5.1.5 South Atlantic Council's Rationale

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

Chapter 6. Cumulative Effects

To be updated

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 Vision Blueprint Regulatory Amendment 26 (Regulatory Amendment 26) 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 the present.

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

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 C (History of Management)**.

Past Actions

Amendment 28 to the Snapper Grouper FMP set the commercial and recreational red snapper annual catch limits (ACL) at zero and established a process for setting fishing seasons to allow limited harvest of red snapper in the South Atlantic. The regulations were effective on August 23, 2013.

The South Atlantic Headboat Reporting Amendment was implemented on January 27, 2014, and requires that all federally-permitted headboats on the South Atlantic report their landings information electronically, and on a weekly basis to improve the timeliness and accuracy of harvest data.

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 is expected to improve fisheries

data collection, through more timely and accurate dealer reporting, and streamline the dealer permit system.

Amendment 29 to the Snapper Grouper FMP, which became effective on July 1, 2015, updated the Council's acceptable biological catch (ABC) control rule to incorporate methodology for determining the ABC of "Only Reliable Catch Stocks"; (2) adjusted ABCs for the affected unassessed species; (3) specified annual catch limits (ACLs) for 7 species based on the updated ABCs; and (4) modified management measures for gray triggerfish in federal waters of the South Atlantic region (SAFMC 2014b).

The Generic Accountability Measures (AM) and Dolphin Allocation Amendment, in part, modified AMs for snapper grouper species (including mutton snapper) to make them more consistent with AMs already implemented for other species and other fishery management plans. The regulations became effective on February 22, 2016.

An emergency rule, which became effective on November 2, 2017, established red snapper seasons for the commercial and recreational sectors in the South Atlantic EEZ in 2017.

Amendment 43 to the Snapper Grouper FMP, which became effective on July 26, 2018, established red snapper seasons for the commercial and recreational sectors in the South Atlantic EEZ. The amendment removed the process and equation used to determine the red snapper annual catch limit adopted in Amendment 28 and specified a total ACL of 42,510 fish. The commercial and recreational ACLs were set at 124,815 pounds (whole weight) and 29,656 fish, respectively, according to established sector allocations. The catch limit was based on the highest observed landings of red snapper in a single year from 2012 through 2014.

Present Actions

The Vision Blueprint Recreational Regulatory Amendment 26 to the Snapper Grouper FMP considers actions to establish a recreational 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. The Council approved the amendment for Secretarial review at their December 2018 Council meeting.

The Vision Blueprint Recreational Regulatory Amendment 27 to the Snapper Grouper FMP considers actions to modify commercial regulations for blueline tilefish, snowy grouper, greater amberjack, red porgy, vermilion snapper, almaco jack, Other Jacks Complex, queen snapper, silk snapper, blackfin snapper, and gray triggerfish. Actions include modifying fishing seasons, trip limits, and minimum size limits. The Council approved the amendment for Secretarial review at their September 2018 Council meeting.

Regulatory Amendment 29 to the Snapper Grouper FMP would add or modify regulations pertaining to best fishing practices (e.g., descending devices and circle hooks) and powerhead restrictions. The framework amendment was approved for scoping at the June 2018 meeting and is scheduled to be approved for Secretarial review at the September 2019 Council meeting.

Regulatory Amendment 30 to the Snapper Grouper FMP 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 EEZ off North and South Carolina. The amendment also includes an action to establish a commercial trip limit for red grouper harvested in the South Atlantic EEZ. The Council approved the amendment for Secretarial review at their June 2019 meeting.

Amendment 42 to the Snapper Grouper FMP would add new allowable sea turtle release gear for the commercial and charter/headboat component of the snapper grouper fishery and modify 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 Secretarial review at their March 2019 meeting.

Reasonably Foreseeable Future Actions

Comprehensive Acceptable Biological Catch (ABC) Control Rule Amendment (Amendment 45 to the Snapper Grouper FMP) would modify the ABC control rule, specify an approach for determining the acceptable risk of overfishing and the probability of rebuilding success for overfished stocks, allow phase-in of ABC changes, and allow carry-over of unharvested catch. This amendment will continue being developed in 2019.

Amendment 46 to the Snapper Grouper FMP proposes actions to focus on private recreational permit requirements and reporting. Development of this amendment is currently on hold.

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.

Expected Impacts from Past, Present, and Future Actions

In recent years, participants in the recreational sector of the snapper grouper 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, weather, and water temperature affect availability of species to the recreational fleets in different parts of the Council's jurisdiction.

The intent of Regulatory Amendment 33 is to

When combined with the impacts of past, present, and future actions affecting the snapper grouper fishery, specifically for red snapper, minor cumulative impacts are likely to accrue. For example, there could be beneficial cumulative effects from the actions in this framework amendment, in addition to future proposed actions to reduce overfishing of snapper grouper species, require the use of descending devices, and reducing bycatch. Also, there may be cumulative socio-economic effects by promoting access to the fishery which would improve recreational fishing opportunities and benefits to associated businesses and communities; however, the actions in this framework amendment are not expected to result in significant

cumulative adverse biological or socio-economic effects to the snapper grouper fishery when combined with the impacts of past, present, and future actions (see **Chapter 4**).

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.fisheries.noaa.gov/topic/climate), 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 Regulatory

Amendment 29 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 amendment. However, the effects of the oil spill on fish species would be taken into consideration in future SEDAR 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 actions are intended to address recreational stakeholder input to increase predictability for the deep-water component of the recreational snapper grouper fishery, minimize regulatory discards, and improve regulatory compliance and consistency. The actions are expected to improve management of the recreational component of the snapper grouper fishery to achieve optimum yield, while minimizing, to the extent practicable, adverse socio-economic effects for recreational fishermen in the South Atlantic Region. The proposed management actions are summarized in **Chapter 2** of this document. Detailed discussions of the magnitude and significance of the impacts of the alternatives on the human environment appear in **Chapter 4** of this document. None of the impacts of the actions in this amendment, in combination with past, present, and future actions have been determined to be significant. Although several other management actions, in addition to this 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. These actions are not likely to result in direct, indirect, or cumulative effects to unique areas, such as significant scientific, cultural, or historical resources, park land, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas as the proposed action is not expected to substantially increase fishing effort or the spatial and/or temporal distribution of current fishing effort within the South Atlantic region. The U.S. Monitor, Gray's Reef, and Florida Keys National Marine Sanctuaries are within the boundaries of the South Atlantic EEZ. The proposed actions are not likely to cause loss or destruction of these national marine sanctuaries because the actions are not expected to result in appreciable changes to current fishing practices. Additionally, the proposed actions are 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 recreational 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 actions relate to the harvest of indigenous species in the Atlantic, and the activities/regulations being altered do not introduce non-indigenous species, and are 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 Interdisciplinary Plan Team (IPT) Members

Update

Name	Agency/Division	Title
Brian Cheuvront	SAFMC	Deputy Executive Director for Management
Myra Brouwer	SAFMC	IPT Lead/Fishery Biologist
Chip Collier	SAFMC	Fishery Scientist/Data Analyst
Scott Crosson	SEFSC	Economist
Rick DeVictor	SERO/SF	South Atlantic Branch Chief
Mike Errigo	SAFMC	Data analyst
Frank Helies	SERO/SF	IPT Lead/Fishery Biologist
Tony Lamberte	SERO/SF	Economist
Michael Larkin	SERO/SF	Data Analyst
Jennifer Lee	SERO/PR	Biologist
Christina Package-Ward	SERO/SF	Social Scientist
Nikhil Mehta	SERO/SF	Fishery Biologist - NEPA
Scott Sandorf	SERO/SF	Technical Writer and Editor
Kate Siegfried	SEFSC	Biologist
Monica Smit-Brunello	NOAA GC	General Counsel
TBD	SERO/OLE	
Christina Wiegand	SAFMC	Social Scientist

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

South Atlantic
South Atlantic Fishery Management Council
4055 Faber Place Drive, Suite 201
Charleston, South Carolina 29405
(843) 571-4366 (TEL)
Toll Free: 866-SAFMC-10
(843) 769-4520 (FAX)
safmc@safmc.net

Environmental Assessment:
NMFS, Southeast Region
263 13th Avenue South
St. Petersburg, Florida 33701
(727) 824-5301 (TEL)
(727) 824-5320 (FAX)

List of Agencies, Organizations, and Persons Consulted

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

Chapter 9. References

Update

Carter, D. W. and C. Liese. 2012. The Economic Value of Catching and Keeping or Releasing Saltwater Sport Fish in the Southeast USA. North American Journal of Fisheries Management 32(4): 613-625. http://dx.doi.org/10.1080/02755947.2012.675943

Haab, T., R.L. Hicks, K. Schnier, and J.C. Whitehead. 2012. Angler heterogeneity and the species-specific demand for marine recreational fishing. Working Paper No. 10-02. Appalachian State University, Department of Economics. Available: http://econ.appstate.edu/marfin/. (September 2014).

Hayes, S., E. Josephson, K. Maze-Foley, and P.E. Rosel. 2017. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments - 2016. NOAA Technical Memorandum NMFS – NE-241. U.S. Department of Commerce – Woods Hole, MA.

IPCC (Intergovernmental Panel on Climate Change). 2014. Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp.

Jacob, S., P. Weeks, B. Blount, and M. Jepson. 2013. Development and evaluation of social indicators of vulnerability and resiliency for fishing communities in the Gulf of Mexico. Marine Policy 37:86-95.

Jepson, M. and L. L. Colburn. 2013. Development of social indicators of fishing community vulnerability and resilience in the U.S. Southeast and Northeast Regions. U.S. Dept. of Commerce, NOAA Technical Memorandum NMFS-F/SPO-129, 64 p.

Kennedy, V.S., R.R. Twilley, J.A. Kleypas, J.H. Cowan, Jr., and S.R. Hare. 2002. Coastal and Marine Ecosystems & Global Climate Change: Potential Effects on U.S. Resources. Pew Center on Global Climate Change. 52 p.

Liese C., and D. Carter. 2011. Collecting economic data from the for-hire fishing sector: Lessons from a cost and earnings survey of the southeast U.S. charter boat industry. In T. D. Beard, Jr., R. Arlinghaus, and S. G. Sutton (Editors), The angler in the environment: social, economic, biological, and ethical dimensions. Proc. Fifth World Recreational Fish. Conf., p. 279–292. Am. Fish. Soc., Symp. 75, Bethesda, MD.

MacIntyre, I.G. and J.D. Milliman. 1970. Physiographic features on the outer shelf and upper slope, Atlantic Continental Margin, southeastern United States. Geological Society of America Bulletin 81:2577-2598.

Miller, G.C. and W.J. Richards. 1979. Reef fish habitat, faunal assemblages and factors determining distributions in the South Atlantic Bight. Proceedings of the Gulf and Caribbean Fisheries Institute 32:114-130.

Needham, H., D. Brown, and L. Carter. 2012. Impacts and adaptation options in the Gulf coast. Report prepared for the Center for Climate and Energy Solutions. 38 pp. http://www.c2es.org/docUploads/gulf-coast-impacts-adaptation.pdf

Newton J.G., O.H. Pilkey, and J.O. Blanton. 1971. An Oceanographic Atlas of the Carolina and continental margin. North Carolina Dept. of Conservation and Development. 57 p.

NMFS (National Marine Fisheries Service). 2015. Fisheries Economics of the United States, 2013. U.S. Dept. of Commerce, NOAA Technical Memorandum NMFS-F/SPO-159.

NMFS (National Marine Fisheries Service). 2016. Endangered Species Act Section 7 consultation on the continued authorization of snapper grouper fishing in the U.S. South Atlantic EEZ as Managed under the Snapper Grouper Fishery Management Plan (SGFMP) of the South Atlantic Region, including Proposed Regulatory Amendment 16 to the SGFMP. Biological Opinion. December 1.

Parker, R.O., D.R. Colby, and T.D. Willis. 1983. Estimated amount of reef habitat on a portion of the U.S. South Atlantic and Gulf of Mexico Continental Shelf. Bulletin of Marine Science 33:935-940.

Rademeyer and Butterworth. 2014. Assessment of the US South Atlantic Wreckfish using primarily Statistical Catch-at-Age Assessment Methodology following the Recommendations fo the November 2013 SAFMC SSC Wreckfish Assessment Workshop. 51pp.

SAFMC (South Atlantic Fishery Management Council). 1983. Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Cir., Ste 306, Charleston, S.C. 29407.

SAFMC (South Atlantic Fishery Management Council). 2006. Amendment 13C, Final Environmental Assessment, Initial Regulatory Flexibility Analysis/Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement for the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Cir., Ste 306, Charleston, S.C. 29407-4699. 631 pp.

SAFMC (South Atlantic Fishery Management Council). 2008a. Amendment 15A, Final Environmental Impact Statement, Initial Regulatory Flexibility Analysis/Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement for the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.
SAFMC (South Atlantic Fishery Management Council). 2008b. Amendment 15B, Final Environmental Impact Statement, Initial Regulatory Flexibility Analysis/Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement for the Fishery Management

Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2009a. Amendment 16, Final Environmental Impact Statement, Initial Regulatory Flexibility Analysis/Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement for the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2009b. Fishery Ecosystem Plan for the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2010a. Amendment 17A, Final Environmental Impact Statement, Initial Regulatory Flexibility Analysis/Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement for 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). 2010b. Amendment 17B, Final Environmental Impact Statement, Initial Regulatory Flexibility Analysis/Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement for the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2011a. Regulatory Amendment 9, Final Environmental Assessment, Regulatory Flexibility Analysis/Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement for the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2011b. Comprehensive Ecosystem Based Amendment 2, Final Environmental Assessment, Regulatory Flexibility Analysis/Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement for the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. (Amendment 23 to the Snapper Grouper FMP). South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2011c. Comprehensive Annual Catch Limit Amendment for the South Atlantic Region with Final Environmental Impact Statement, Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2013. Modifications to federally permitted seafood dealer reporting requirements. South Atlantic Fishery Management Council,

4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2014. Amendment 29 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2015. 2016-2020 Vision Blueprint 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). 2016. Amendment 37 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Impact Statement, Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2017. Amendment 41 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2018. Amendment 43 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SEDAR (Southeast Data, Assessment, and Review) 36. 2014. Final Stock Assessment Report: South Atlantic Snowy Grouper. SEDAR, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. Available at: http://sedarweb.org/sedar-36

SEDAR (Southeast Data, Assessment, and Review) 15A Update. 2015. Final Stock Assessment Report: South Atlantic and Gulf of Mexico Mutton Snapper. SEDAR, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. Available at: http://sedarweb.org/sedar-15a

SEDAR (Southeast Data, Assessment, and Review) 41. 2016. Stock Assessment Report: South Atlantic Gray Triggerfish. SEDAR, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. Available at: http://sedarweb.org/sedar-41

SEDAR (Southeast Data, Assessment, and Review) 25 Update. 2016. Final Stock Assessment Report: South Atlantic Golden Tilefish. SEDAR, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. Available at: http://sedarweb.org/sedar-25a

Appendix A. Considered But Rejected Alternatives

Appendix B. 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 framework 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 (SAFMC): 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 C. History of Management

Appendix D. Bycatch Practicability Analysis

Appendix E. Regulatory Impact Review

Appendix F. Regulatory Flexibility Analysis

Appendix G. Other Applicable Laws

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. Vision Blueprint Recreational Regulatory Amendment 26 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Regulatory Amendment 26) complies with the provisions of the APA through the South Atlantic Fishery Management Council's (Council) extensive use of public meetings, requests for comments and consideration of comments. The proposed rule associated with this amendment 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. Regulatory Amendment 26 uses the best available information 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 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 its most recent formal consultation on the snapper grouper fishery of the South Atlantic Region. In the resulting biological opinion (2016 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.

Additionally, 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. 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.

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 summary information on species, or DPSs of species, protected by federal law that may occur in the EEZ of the South Atlantic Region, or the 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 (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.

A regulation is significant if it: 1) has an annual effect on the economy of $100 million or more or adversely affects in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments and communities; 2) creates a serious inconsistency or otherwise interferes with an action taken or planned by another agency; 3) materially alters the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or 4) raises novel legal or policy issues arising out of legal mandates,the President's priorities, or the principles set forth in this Executive Order.

This 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 **Chapters 3** and **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 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 final List of Fisheries (LOF) for 2017 and 2018 (82 FR 3655, January 12, 2017; and 83 FR 5349, February 7, 2018, respectively) because there have been no documented interactions between these gear and marine mammals. The black sea bass pot component of the South Atlantic snapper grouper fishery is part of the Atlantic mixed species trap/pot fishery, a Category II fishery, in the final List of Fisheries (LOF) for 2017 and 2018 (82 FR 3655, January 12, 2017; and 83 FR 5349, February 7, 2018, respectively). The Atlantic mixed species trap/pot fishery designation was created in 2003 (68 FR 41725, July 15, 2003), by combining several separately listed trap/pot fisheries into a single group. This group was designated Category II as a precaution because of known interactions between marine mammals

and gear similar to those included in this group. Prior to this consolidation, the black sea bass pot fishery in the South Atlantic was a part of the "U.S. Mid-Atlantic and Southeast U.S. Atlantic Black Sea Bass Trap/Pot" fishery (Category III). There has never been a documented interaction between marine mammals and black sea bass trap/pot gear in the South Atlantic. The actions 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- 6A, Section 7.

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. Actions in this document are not expected to affect 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 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.

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 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 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. Essential Fish Habitat and Ecosystem-based Management

South Atlantic Fishery Management Council Habitat Conservation, Ecosystem Coordination and Collaboration

The South Atlantic Fishery Management Council (Council), using the Essential Fish Habitat (EFH) Plan as the cornerstone, adopted a strategy to facilitate the move to an ecosystem-based approach to fisheries management in the region. This approach required a greater understanding of the South Atlantic ecosystem and the complex relationships among humans, marine life, and the environment including essential fish habitat. To accomplish this, a process was undertaken to facilitate the evolution of the Habitat Plan into a Fishery Ecosystem Plan (FEP), thereby providing a more comprehensive understanding of the biological, social, and economic impacts of management necessary to initiate the transition from single species management to ecosystem-based management in the region.

Moving to Ecosystem-Based Management

The Council adopted broad goals for Ecosystem-Based Management to include maintaining or improving ecosystem structure and function; maintaining or improving economic, social, and cultural benefits from resources; and maintaining or improving biological, economic, and cultural diversity. Development of a regional FEP (SAFMC 2009b) provided an opportunity to expand the scope of the original Council Habitat Plan and compile and review available habitat, biological, social, and economic fishery and resource information for fisheries in the South Atlantic ecosystem. The Council views habitat conservation as the core of the move to EBM in the region. Therefore, development of the FEP was a natural next step in the evolution and expands and significantly updates the SAFMC Habitat Plan (SAFMC 1998a) incorporating comprehensive details of all managed species (SAFMC, South Atlantic States, ASMFC, and NOAA Fisheries Highly Migratory Species and Protected Species) including their biology, food web dynamics, and economic and social characteristics of the fisheries and habitats essential to their survival. The FEP therefore serves as a source document and presents more complete and detailed information describing the South Atlantic ecosystem and the impact of fisheries on the environment. This FEP updated information on designated EFH and EFH-Habitat Areas of Particular Concern; expanded descriptions of biology and status of managed species; presented information that will support ecosystem considerations for managed species; and described the social and economic characteristics of the fisheries in the region. In addition, it expanded the discussion and description of existing research programs and needs to identify biological, social, and economic research needed to fully address ecosystem-based management in the region. It is anticipated that the FEP will provide a greater degree of guidance by fishery, habitat, or major ecosystem consideration of bycatch reduction, prey-predator interactions, maintaining biodiversity, and spatial management needs. This FEP serves as a living source document of biological, economic, and social information for all Fishery Management Plans (FMP). Future Environmental Assessments and Environmental Impact Statements associated with subsequent amendments to Council FMPs will draw from or cite by reference the FEP.

The Fishery Ecosystem Plan for the South Atlantic Region encompasses the following volume structure:
FEP Volume I - Introduction and Overview of FEP for the South Atlantic Region
FEP Volume II - South Atlantic Habitats and Species
FEP Volume III - South Atlantic Human and Institutional Environment
FEP Volume IV - Threats to South Atlantic Ecosystem and Recommendations
FEP Volume V - South Atlantic Research Programs and Data Needs
FEP Volume VI - References and Appendices

Comprehensive Ecosystem-Based Amendment (CE-BA) 1 (SAFMC 2009b) is supported by this FEP and updated EFH and EFH-HAPC information and addressed the Final EFH Rule (e.g., GIS presented for all EFH and EFH-HAPCs). Management actions implemented in CE-BA 1 established deep-water Coral HAPCs to protect what is thought to be the largest continuous distribution (>23,000 square miles) of pristine, deep-water coral ecosystems in the world.

The Fishery Ecosystem Plan, slated to be revised every 5 years, will again be the vehicle to update and refine information supporting designation and future review of EFH and EFH-HAPCs for managed species. Planning for the update is being conducted in cooperation with the Habitat Advisory Panel during the fall and winter of 2013 with initiation during 2014.

Ecosystem Approach to Deep-water Ecosystem Management

The Council manages coral, coral reefs and live/hard bottom habitat, including deep-water corals, through the Fishery Management Plan for Coral, Coral Reefs and Live/Hard Bottom Habitat of the South Atlantic Region (Coral FMP). Mechanisms exist in the FMP, as amended, to further protect deep-water coral and live/hard bottom habitats. The SAFMC's Habitat and Environmental Protection Advisory Panel and Coral Advisory Panel have supported proactive efforts to identify and protect deep-water coral ecosystems in the South Atlantic region. Management actions in Comprehensive Ecosystem-Based Amendment (CE-BA 1) (SAFMC 2009b) established deep-water coral HAPCs (C- HAPCs) to protect what is thought to be the largest continuous distribution (>23,000 square miles) of pristine deep-water coral ecosystems in the world. In addition, CE-BA 1 established areas within the CHAPC, which provide for traditional fishing in limited areas, which do not impact deep-water coral habitat. CE-BA 1, supported by the FEP, also addressed non-regulatory updates for existing EFH and EFH- HAPC information and addressed the spatial requirements of the Final EFH Rule (i.e., GIS presented for all EFH and EFH-HAPCs). Actions in this amendment included modifications in the management of the following: octocorals; special management zones (SMZs) off the coast of South Carolina; and sea turtle release gear requirements for snapper grouper fishermen. The amendment also designated essential fish habitat (EFH) and EFH-Habitat Areas of Particular Concern (EFH-HAPCs).

CE-BA 2 established annual catch limits (ACL) for octocorals in the South Atlantic as well as modifying the Fishery Management Unit (FMU) for octocorals to remove octocorals off the coast of Florida from the FMU (SAFMC 2011). The amendment also limited the possession of managed species in the SMZs off South Carolina to the recreational bag limit for snapper grouper and coastal migratory pelagic species; modified sea turtle release gear requirements for

the snapper grouper fishery based upon freeboard height of vessels; amends Council fishery management plans (FMPs) to designate or modify EFH and EFH-HAPCs, including the FMP for Pelagic Sargassum Habitat; amended the Coral FMP to designate EFH for deep-water Coral HAPCs designated under CE-BA 1; and amended the Snapper Grouper FMP to designate EFH-HAPCs for golden and blueline tilefish and the deep-water Marine Protected Areas. The final rule was published in the Federal Register on December 30, 2011, and regulations became effective on January 30, 2012.

Building from a Habitat to an Ecosystem Network to Support the Evolution

Starting with our Habitat and Environmental Protection Advisory Panel, the Council expanded and fostered a comprehensive Habitat network in our region to develop the Habitat Plan of the South Atlantic Region completed in 1998 to support the EFH rule. Building on the core regional collaborations, the Council facilitated an expansion to a Habitat and Ecosystem network to support development of the FEP and CE-BA as well as coordinate with partners on other regional efforts.

Integrated Ocean Observing System (IOOS) and Southeast Coastal and Ocean Observing Regional Association (SECOORA)

The Integrated Ocean Observing System (IOOS®) is a partnership among federal, regional, academic, and private sector parties that works to provide new tools and forecasts to improve safety, enhance the economy, and protect our environment. IOOS supplies critical information about our Nation's oceans, coasts, and Great Lakes. Scientists working to understand climate change, governments adapting to changes in the Arctic, municipalities monitoring local water quality, and industries affected by coastal and marine spatial planning all have the same need: reliable, timely, and sustained access to data and information that inform decision making. Improving access to key marine data and information supports several purposes. IOOS data sustain national defense, marine commerce, and navigation safety. Scientists use these data to issue weather, climate, and marine forecasts. IOOS data are also used to make decisions for energy siting and production, economic development, and ecosystem-based resource management. Emergency managers and health officials need IOOS information to make decisions about public safety. Teachers and government officials rely on IOOS data for public outreach, training, and education.

SECOORA is one of 11 Regional Associations established nationwide through the US IOOS whose primary source of funding is through a 5-year cooperative agreement titled "Coordinated Monitoring, Prediction, and Assessment to Support Decision-Makers Needs for Coastal and Ocean Data and Tools". However, SECOORA was recently awarded funding via a NOAA Regional Ocean Partnership grant through the Governors' South Atlantic Alliance. SECOORA is the regional solution to integrating coastal and ocean observing data in the Southeast United States to inform decision makers and the general public. The SECOORA region encompasses 4 states, over 42 million people, and spans the coastal ocean from North Carolina to the west Coast of Florida and is creating customized products to address these thematic areas: Marine Operations; Coastal Hazards; Ecosystems, Water Quality, Living Marine Resources; and Climate Change. The Council is a voting member and Council staff was recently re-elected to serve on the Board of Directors for the Southeast Coastal Regional Ocean Observing Association to guide and direct priority needs for observation and modeling to support fisheries oceanography and

integration into stock assessments through SEDAR. Cooperation through SECOORA is envisioned to facilitate the following:

- •Refining current or water column designations of EFH and EFH-HAPCs (e.g., Gulf Stream and Florida Current).
- •Providing oceanographic models linking benthic, pelagic habitats, and food webs.
- •Providing oceanographic input parameters for ecosystem models.
- •Integration of OOS information into Fish Stock Assessment process in the SA region.
- •Facilitating OOS system collection of fish and fishery data and other research necessary to support the Council's use of area-based management tools in the SA Region including but not limited to EFH, EFH-HAPCs, Marine Protected Areas, Deep-water Coral Habitat Areas of Particular Concern, Special Management Zones, and Allowable Gear Areas.
- •Integration of OOS program capabilities and research Needs into the South Atlantic Fishery Ecosystem Plan.
- •Collaboration with SECOORA to integrate OOS products with information included in the Council's Habitat and Ecosystem Web Services and Atlas to facilitate model and tool development.
- •Expanding Map Services and the Regional Habitat and Ecosystem Atlas in cooperation with SECOORAs Web Services that will provide researchers access to data or products including those collected/developed by SA OOS partners.

SECOORA researchers are developing a comprehensive data portal to provide discovery of, access to, and metadata about coastal ocean observations in the southeast US. Below are various ways to access the currently available data.

One project recently funded by SECOORA initiated development of species specific habitat models that integrate remotely sensed and in situ data to enhance stock assessments for species managed by the Council. The project during 2013/2014 was initiated to address red porgy, gray triggerfish, black seabass, and vermilion snapper. Gray triggerfish and red porgy are slated for assessment through SEDAR in 2014/15 and 2015/16 respectively.

National Fish Habitat Plan and Southeast Aquatic Resource Partnership (SARP)

In addition, the Council serves on the National Habitat Board and, as a member of the Southeast Aquatic Resource Partnership (SARP), has highlighted this collaboration by including the Southeast Aquatic Habitat Plan (SAHP) and associated watershed conservation restoration targets into the FEP. Many of the habitat, water quality, and water quantity conservation needs identified in the threats and recommendations Volume of the FEP are directly addressed by on-the-ground projects supported by SARP. This cooperation results in funding fish habitat restoration and conservation intended to increase the viability of fish populations and fishing opportunity, which also meets the needs to conserve and manage
EFH for Council managed species or habitat important to their prey. To date, SARP has funded 53 projects in the region through this program. This work supports conservation objectives identified in the SAHP to improve, establish, or maintain riparian zones, water quality, watershed connectivity, sediment flows, bottoms and shorelines, and fish passage, and addresses other key factors associated with the loss and degradation of fish habitats. SARP also developed the Southern Instream Flow Network (SIFN) to address the impacts of flow alterations in the Southeastern US aquatic ecosystems which leverages policy, technical experience, and scientific

resources among partners based in 15 states. Maintaining appropriate flow into South Atlantic estuarine systems to support healthy inshore habitats essential to Council managed species is a major regional concern and efforts of SARP through SIFN are envisioned to enhance state and local partners ability to maintain appropriate flow rates.

Governor's South Atlantic Alliance (GSAA)

Initially discussed as a South Atlantic Eco-regional Compact, the Council has also cooperated with South Atlantic States in the formation of a Governor's South Atlantic Alliance (GSAA). This will also provide regional guidance and resources that will address State and Council broader habitat and ecosystem conservation goals. The GSAA was initiated in 2006. An Executive Planning Team (EPT), by the end of 2007, had created a framework for the Governors South Atlantic Alliance. The formal agreement between the four states (NC, SC, GA, and FL) was executed in May 2009. The Agreement specifies that the Alliance will prepare a "Governors South Atlantic Alliance Action Plan" which will be reviewed annually for progress and updated every five years for relevance of content. The Alliance's mission and purpose is to promote collaboration among the four states, and with the support and interaction of federal agencies, academe, regional organizations, non-governmental organizations, and the private sector, to sustain and enhance the region's coastal and marine resources. The Alliance proposes to regionally implement science-based actions and policies that balance coastal and marine ecosystems capacities to support both human and natural systems. The GSAA Action Plan was released in December 2010 and describes the four Priority Issue Areas that were identified by the Governors to be of mutual importance to the sustainability of the region's resources: Healthy Ecosystems; Working Waterfronts; Clean Coastal and Ocean Waters; and Disaster-Resilient Communities. The goals, objectives, actions, and implementation steps for each of these priorities were further described in the GSAA Implementation Plan released in July 2011. The final Action Plan was released on December 1, 2010 and marked the beginning of intensive work by the Alliance Issue Area Technical Teams (IATTs) to develop implementation steps for the actions and objectives. The GSAA Implementation Plan was published July 6, 2011, and the Alliance has been working to implement the Plan through the IATTs and two NOAA-funded Projects. The Alliance also partners with other federal agencies, academia, non-profits, private industry, regional organizations, and others. The Alliance supports both national and state-level ocean and coastal policy by coordinating federal, state, and local entities to ensure the sustainability of the region's economic, cultural, and natural resources. The Alliance has organized itself around the founding principles outlined in the GSAA Terms of Reference and detailed in the GSAA Business Plan. A team of natural resource managers, scientists, and information management system experts have partnered to develop a Regional Information Management System (RIMS) and recommend decision support tools that will support regional collaboration and decision-making. In addition to regional-level stakeholders, state and local coastal managers and decision makers will also be served by this project, which will enable ready access to new and existing data and information. The collection and synthesis of spatial data into a suite of visualization tools is a critical step for long-term collaborative planning in the South Atlantic region for a wide range of coastal uses. The Council's Atlas presents the spatial representations of EFH, managed areas, regional fish and fish habitat distribution, and fishery operation information and it can be linked to or drawn on as a critical part of the collaboration with the RIMS.

South Atlantic Landscape Conservation Cooperative

One of the more recent collaborations is the Council's participation as Steering Committee member for the newly establish South Atlantic Landscape Conservation Cooperative (SALCC). Landscape Conservation Cooperatives (LCCs) are applied conservation science partnerships focused on a defined geographic area that informs on-the-ground strategic conservation efforts at landscape scales. LCC partners include DOI agencies, other federal agencies, states, tribes, non-governmental organizations, universities, and others. The newly formed Department of Interior Southeast Climate Services Center (CSC) has the LCCs in the region as their primary clients. One of the initial charges of the CSCs is to downscale climate models for use at finer scales.

The SALCC developed a Strategic Plan through an iterative process that began in December 2011. The plan provides a simple strategy for moving forward over the next few years. An operations plan was developed under direction from the SALCC Steering Committee to redouble efforts to develop version 1.0 of a shared conservation blueprint by spring-summer of 2014. The SALCC is developing the regional blueprint to address the rapid changes in the South Atlantic including but not limited to climate change, urban growth, and increasing human demands on resources which are reshaping the landscape. While these forces cut across political and jurisdictional boundaries, the conservation community does not have a consistent cross-boundary, cross-organization plan for how to respond. The South Atlantic Conservation Blueprint will be that plan. The blueprint is envisioned to be a spatially-explicit map depicting the places and actions need to sustain South Atlantic LCC objectives in the face of future change. The steps to creating the blueprint include development of: indicators and targets (shared metrics of success); the State of the South Atlantic (past, present, and future condition of indicators); and a Conservation Blueprint. Potential ways the blueprint could be used include: finding the best places for people and organizations to work together; raising new money to implement conservation actions; guiding infrastructure development (highways, wind, urban growth, etc.); creating incentives as an alternative to regulation; bringing a landscape perspective to local adaptation efforts; and locating places and actions to build resilience after major disasters (hurricanes, oil spills, etc.). Integration of connectivity, function, and threats to river, estuarine and marine systems supporting Council managed species is supported by the SALCC and enhanced by the Council being a voting member of its Steering Committee. In addition, the Council's Regional Atlas presents spatial representations of Essential Fish Habitat, managed areas, regional fish and fish habitat distribution, and fishery operation information and it be linked to or drawn on as a critical part of the collaboration with the recently developed SALCC Conservation Planning Atlas.

Building Tools to support EBM in the South Atlantic Region

The Council has developed a Habitat and Ecosystem Section of the website http://www.safmc.net/ecosystem/Home/EcosystemHome/tabid/435/Default.aspx and, in cooperation with the Florida Wildlife Research Institute (FWRI), developed a Habitat and Ecosystem Internet Map Server (IMS). The IMS was developed to support Council and regional partners' efforts in the transition to EBM. Other regional partners include NMFS Habitat Conservation, South Atlantic States, local management authorities, other Federal partners, universities, conservation organizations, and recreational and commercial fishermen. As technology and spatial information needs evolved, the distribution and use of GIS demands greater capabilities. The Council has continued its collaboration with FWRI in the now

evolution to Web Services provided through the regional SAFMC Habitat and Ecosystem Atlas (http://ocean.floridamarine.org/safmc_atlas/) and the SAFMC Digital Dashboard (http://ocean.floridamarine.org/safmc_dashboard/). The Atlas integrates services for the following:

Species distribution and spatial presentation of regional fishery independent data from the SEAMAP-SA, MARMAP, and NOAA SEFIS systems; SAFMC Fisheries: (http://ocean.floridamarine.org/SA_Fisheries/)

Essential Fish Habitat and Essential Fish Habitat Areas of Particular Concern; SAFMC EFH: (http://ocean.floridamarine.org/sa_efh/)

Spatial presentation of managed areas in the region; SAFMC Managed Areas: (http://ocean.floridamarine.org/safmc_managedareas/)

An online life history and habitat information system supporting Council managed, State managed, and other regional species was developed in cooperation with FWRI. The Ecospecies system is considered dynamic and presents, as developed, detailed individual species life history reports and provides an interactive online query capability for all species included in the system: http://atoll.floridamarine.org/EcoSpecies

Web Services System Updates:
Essential Fish Habitat (EFH) – displays EFH and EFH-HAPCS for SAFMC managed species and NOAA Fisheries Highly Migratory Species.
Fisheries - displays Marine Resources Monitoring, Assessment, and Prediction (MARMAP) and Southeast Area Monitoring and Assessment Program South Atlantic (SEAMAP-SA) data.
Managed Areas - displays a variety of regulatory boundaries (SAFMC and Federal) or management boundaries within the SAFMC's jurisdiction.
Habitat – displays habitat data collected by SEADESC, Harbor Branch Oceanographic Institute (HBOI), and Ocean Exploration dives, as well as the SEAMAP shallow and ESDIM deep-water bottom mapping projects, multibeam imagery, and scientific cruise data.
Multibeam Bathymetry - displays a variety of multibeam data sources and scanned bathymetry charts.
Nautical Charts – displays coastal, general, and overview nautical charts for the SAFMC's jurisdictional area.

Ecosystem Based Action, Future Challenges and Needs

The Council has implemented ecosystem-based principles through several existing fishery management actions including establishment of deep-water Marine Protected Areas for the Snapper Grouper fishery, proactive harvest control rules on species (e.g., dolphin and wahoo) which are not overfished, implementing extensive gear area closures which in most cases eliminate the impact of fishing gear on EFH, and use of other spatial management tools including Special Management Zones. Pursuant to development of the Comprehensive Ecosystem-Based Amendment, the Council has taken an ecosystem approach to protect deep-water ecosystems while providing for traditional fisheries for the Golden Crab and Royal Red shrimp in areas where they do not impact deep-water coral habitat. The stakeholder based process taps in on an

extensive regional Habitat and Ecosystem network. Supporttools facilitate Council deliberations and with the help of regional partners, are being refined to address long-term ecosystem management needs.

One of the greatest challenges to the long-term move to EBM in the region is funding high priority research, including but not limited to, comprehensive benthic mapping and ecosystem model and management tool development. In addition, collecting detailed information on fishing fleet dynamics including defining fishing operation areas by species, species complex, and season, as well as catch relative to habitat is critical for assessment of fishery, community, and habitat impacts and for Council use in place based management measures. Additional resources need to be dedicated to expand regional coordination of modeling, mapping, characterization of species use of habitats, and full funding of regional fishery independent surveys (e.g., MARMAP, SEAMAP, and SEFIS) which are linking directly to addressing high priority management needs. Development of ecosystem information systems to support Council management should build on existing tools (e.g., Regional Habitat and Ecosystem GIS and Arc Services) and provide resources to regional cooperating partners for expansion to address long-term Council needs.

The FEP and CE-BA 1 complement, but do not replace, existing FMPs. In addition, the FEP serves as a source document to the CE-BAs. NOAA should support and build on the regional coordination efforts of the Council as it transitions to a broader management approach. Resources need to be provided to collect information necessary to update and refine our FEP and support future fishery actions including but not limited to completing one of the highest priority needs to support EBM, the completion of mapping of near-shore, mid-shelf, shelf edge, and deep-water habitats in the South Atlantic region. In developing future FEPs, the Council will draw on SAFEs (Stock Assessment and Fishery Evaluation reports) which NMFS is required to provide the Council for all FMPs implemented under the Magnuson-Stevens Act. The FEP, which has served as the source document for CE-BAs, could also meet some of the NMFS SAFE requirements if information is provided to the Council to update necessary sections.

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

The Council actively comments on non-fishing projects or policies that may impact fish habitat. Appendix A of the Comprehensive Amendment Addressing Essential Fish Habitat in Fishery Management Plans of the South Atlantic Region (SAFMC 1998b) outlines the Council's comment and policy development process and the establishment of a four-state Habitat Advisory Panel. Members of the Habitat Advisory Panel serve as the Council's habitat contacts and professionals in the field. AP members bring projects to the Council's attention, draft comment letters, and attend public meetings. With guidance from the Advisory Panel, the Council has developed and approved policies on:

1. Energy exploration, development, transportation, and hydropower re-licensing;
2. Beach dredging and filling and large-scale coastal engineering;
3. Protection and enhancement of submerged aquatic vegetation;
4. Alterations to riverine, estuarine, and nearshore flows;
5. Marine aquaculture;
6. Marine Ecosystems and Non-Native and Invasive Species: and

7. Estuarine Ecosystems and Non-Native and Invasive Species.

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

The Habitat and Environmental Protection Advisory Panel, as part of their role in providing continued policy guidance to the Council, is during 2013/14, reviewing and proposing revisions and updates to the existing policy statements and developing new ones for Council consideration. The effort is intended to enhance the value of the statements and support cooperation and collaboration with NOAA Fisheries Habitat Conservation Division and State and Federal partners in better addressing the Congressional mandates to the Council associated with designation and conservation of EFH in the region.

South Atlantic Bight Ecopath Model

The Council worked cooperatively with the University of British Columbia and the Sea Around Us project to develop a straw-man and preliminary food web models (Ecopath with Ecosim) to characterize the ecological relationships of South Atlantic species, including those managed by the Council. This effort was envisioned to help the Council and cooperators in identifying available information and data gaps while providing insight into ecosystem function. More importantly, the model development process provides a vehicle to identify research necessary to better define populations, fisheries, and their interrelationships. While individual efforts are still underway in the South Atlantic, only with significant investment of new resources through other programs will a comprehensive regional model be further developed.

The latest collaboration builds on the previous Ecopath model developed through the Sea Around Us project for the South Atlantic Bight with a focus on beginning a dialogue on the implications of potential changes in forage fish populations in the region that could be associated with environmental or climate change or changes in direct exploitation of those populations.

Essential Fish Habitat and Essential Fish Habitat Areas of Particular Concern

Following is a summary of the current Council's EFH and EFH-HAPCs. Information supporting their designation was updated (pursuant to the EFH Final Rule) in the Council's Fishery Ecosystem Plan and Comprehensive Ecosystem Amendment:

Snapper Grouper FMP

Essential fish habitat for snapper grouper species 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 600 feet (but to at least 2,000 feet for wreckfish) where the annual water temperature range is sufficiently warm to maintain adult populations of members of this largely tropical complex. EFH includes the spawning area in the water column above the adult habitat and the additional pelagic environment, including *Sargassum*, required for larval survival and growth up to and including settlement. In addition the Gulf Stream is an essential fish habitat because it provides a mechanism to disperse snapper grouper larvae.

For specific life stages of estuarine dependent and nearshore snapper grouper species, essential fish habitat includes areas inshore of the 100-foot 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.

Areas which meet the criteria for 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; nearshore hard bottom areas; The Point, The Ten Fathom Ledge, and Big Rock (North Carolina); The Charleston Bump (South Carolina); mangrove habitat; seagrass habitat; oyster/shell habitat; all coastal inlets; all state-designated nursery habitats of particular importance to snapper grouper (e.g., Primary and Secondary Nursery Areas designated in North Carolina); pelagic and benthic *Sargassum*; Hoyt Hills for wreckfish; the *Oculina* Bank Habitat Area of Particular Concern; all hermatypic coral habitats and reefs; manganese outcroppings on the Blake Plateau; and Council-designated Artificial Reef Special Management Zones (SMZs). In addition, the Council through CEBA 2 (SAFMC 2011) designated the deep-water snapper grouper MPAs and golden tilefish and blueline tilefish habitat as EFH-HAPCs under the Snapper Grouper FMP as follows:

EFH-HAPCs for golden tilefish to include irregular bottom comprised of troughs and terraces inter-mingled with sand, mud, or shell hash bottom. Mud-clay bottoms in depths of 150-300 meters are HAPC. Golden tilefish are generally found in 80-540 meters, but most commonly found in 200-meter depths.

EFH-HAPC for blueline tilefish to include irregular bottom habitats along the shelf edge in 45-65 meters depth; shelf break or upper slope along the 100-fathom contour (150-225 meters); hardbottom habitats characterized as rock overhangs, rock outcrops, manganese-phosphorite rock slab formations, or rocky reefs in the South Atlantic Bight; and the Georgetown Hole (Charleston Lumps) off Georgetown, SC.

EFH-HAPCs for the snapper grouper complex to include the following deep-water Marine Protected Areas (MPAs) as designated in Snapper Grouper Amendment 14: Snowy Grouper

Wreck MPA, Northern South Carolina MPA, Edisto MPA, Charleston Deep Artificial Reef MPA, Georgia MPA, North Florida MPA, St. Lucie Hump MPA, and East Hump MPA.

Deep-water Coral HAPCs designated in Comprehensive Ecosystem-Based Amendment 1 are designated as Snapper Grouper EFH-HAPCs: Cape Lookout Coral HAPC, Cape Fear Coral HAPC, Blake Ridge Diapir Coral HAPC, Stetson-Miami Terrace Coral HAPC, and Pourtalés Terrace Coral HAPC.

Shrimp FMP

For penaeid shrimp, EFH includes inshore estuarine nursery areas, offshore marine habitats used for spawning and growth to maturity, and all interconnecting water bodies as described in the Habitat Plan. Inshore nursery areas include tidal freshwater (palustrine), estuarine, and marine emergent wetlands (e.g., intertidal marshes); tidal palustrine forested areas; mangroves; tidal freshwater, estuarine, and marine submerged aquatic vegetation (e.g., seagrass); and subtidal and intertidal non- vegetated flats. This applies from North Carolina through the Florida Keys.

For rock shrimp, essential fish habitat consists of offshore terrigenous and biogenic sand bottom habitats from 18 to 182 meters in depth with highest concentrations occurring between 34 and 55 meters. This applies for all areas from North Carolina through the Florida Keys. Essential fish habitat includes the shelf current systems near Cape Canaveral, Florida, which provide major transport mechanisms affecting planktonic larval rock shrimp. These currents keep larvae on the Florida Shelf and may transport them inshore in spring. In addition, the Gulf Stream is an essential fish habitat because it provides a mechanism to disperse rock shrimp larvae.

Essential fish habitat for royal red shrimp include the upper regions of the continental slope from 180 meters (590 feet) to about 730 meters (2,395 feet), with concentrations found at depths of between 250 meters (820 feet) and 475 meters (1,558 feet) over blue/black mud, sand, muddy sand, or white calcareous mud. In addition, the Gulf Stream is an essential fish habitat because it provides a mechanism to disperse royal red shrimp larvae.

Areas which meet the criteria for EFH-HAPCs for penaeid shrimp include all coastal inlets, all state-designated nursery habitats of particular importance to shrimp (for example, in North Carolina this would include all Primary Nursery Areas and all Secondary Nursery Areas), and state-identified overwintering areas.

Coastal Migratory Pelagics FMP

Essential fish habitat for coastal migratory pelagic species includes sandy shoals of capes and offshore bars, high profile rocky bottom, and barrier island ocean-side waters, from the surf to the shelf break zone, but from the Gulf Stream shoreward, including *Sargassum*. In addition, all coastal inlets and all state-designated nursery habitats of particular importance to coastal migratory pelagics (for example, in North Carolina this would include all Primary Nursery Areas and all Secondary Nursery Areas).

For Cobia essential fish habitat also includes high salinity bays, estuaries, and seagrass habitat. In addition, the Gulf Stream is an EFH because it provides a mechanism to disperse coastal migratory pelagic larvae.

For king and Spanish mackerel and cobia essential fish habitat occurs in the South Atlantic and Mid-Atlantic Bights.

Areas which meet the criteria for EFH-HAPCs include sandy shoals of Capes Lookout, Cape Fear, and Cape Hatteras from shore to the ends of the respective shoals, but shoreward of the Gulf stream; The Point, The Ten-Fathom Ledge, and Big Rock (North Carolina); The Charleston Bump and Hurl Rocks (South Carolina); The Point off Jupiter Inlet (Florida); *Phragmatopoma* (worm reefs) reefs off the central east coast of Florida; nearshore hard bottom south of Cape Canaveral; The Hump off Islamorada, Florida; The Marathon Hump off Marathon, Florida; The "Wall" off of the Florida Keys; Pelagic *Sargassum*; and Atlantic coast estuaries with high numbers of Spanish mackerel and cobia based on abundance data from the ELMR Program. Estuaries meeting these criteria for Spanish mackerel include Bogue Sound and New River, North Carolina; Bogue Sound, North Carolina (Adults May-September salinity >30 ppt); and New River, North Carolina (Adults May-October salinity >30 ppt). For Cobia they include Broad River, South Carolina; and Broad River, South Carolina (Adults & juveniles May-July salinity >25ppt).

Golden Crab FMP

Essential fish habitat for golden crab includes the U.S. Continental Shelf from Chesapeake Bay south through the Florida Straits (and into the Gulf of Mexico). In addition, the Gulf Stream is an essential fish habitat because it provides a mechanism to disperse golden crab larvae. The detailed description of seven essential fish habitat types (a flat foraminferan ooze habitat; distinct mounds, primarily of dead coral; ripple habitat; dunes; black pebble habitat; low outcrop; and soft-bioturbated habitat) for golden crab is provided in Wenner et al. (1987). There is insufficient knowledge of the biology of golden crabs to identify spawning and nursery areas and to identify HAPCs at this time. As information becomes available, the Council will evaluate such data and identify HAPCs as appropriate through the framework.

Spiny Lobster FMP

Essential fish habitat for spiny lobster includes nearshore shelf/oceanic waters; shallow subtidal bottom; seagrass habitat; unconsolidated bottom (soft sediments); coral and live/hard bottom habitat; sponges; algal communities (*Laurencia*); and mangrove habitat (prop roots). In addition, the Gulf Stream is an EFH because it provides a mechanism to disperse spiny lobster larvae.

Areas which meet the criteria for EFH-HAPCs for spiny lobster include Florida Bay, Biscayne Bay, Card Sound, and coral/hard bottom habitat from Jupiter Inlet, Florida through the Dry Tortugas, Florida.

Coral, Coral Reefs, and Live/Hard Bottom Habitats FMP

Essential fish habitat for corals (stony corals, octocorals, and black corals) incorporate habitat for over 200 species. EFH for corals include the following:

A. Essential fish habitat for hermatypic stony corals includes rough, hard, exposed, stable substrate from Palm Beach County south through the Florida reef tract in subtidal waters to 30 m depth; subtropical (15°-35° C), oligotrophic waters with high (30-35$^{o}/_{oo}$) salinity and turbidity levels sufficiently low enough to provide algal symbionts adequate sunlight penetration for photosynthesis. Ahermatypic stony corals are not light restricted and their EFH includes defined hard substrate in subtidal to outer shelf depths throughout the management area.

B. Essential fish habitat for *Antipatharia* (black corals) includes rough, hard, exposed, stable substrate, offshore in high (30-35$^{o}/_{oo}$) salinity waters in depths exceeding 18 meters (54 feet), not restricted by light penetration on the outer shelf throughout the management area.

C. Essential fish habitat for octocorals excepting the order Pennatulacea (sea pens and sea pansies) includes rough, hard, exposed, stable substrate in subtidal to outer shelf depths within a wide range of salinity and light penetration throughout the management area.

D. Essential fish habitat for Pennatulacea (sea pens and sea pansies) includes muddy, silty bottoms in subtidal to outer shelf depths within a wide range of salinity and light penetration.

Areas which meet the criteria for EFH-HAPCs for coral, coral reefs, and live/hard bottom include: The 10-Fathom Ledge, Big Rock, and The Point (North Carolina); Hurl Rocks and The Charleston Bump (South Carolina); Gray's Reef National Marine Sanctuary (Georgia); The *Phragmatopoma* (worm reefs) reefs off the central east coast of Florida; Oculina Banks off the east coast of Florida from Ft. Pierce to Cape Canaveral; nearshore (0-4 meters; 0-12 feet) hard bottom off the east coast of Florida from Cape Canaveral to Broward County); offshore (5-30 meter; 15-90 feet) hard bottom off the east coast of Florida from Palm Beach County to Fowey Rocks; Biscayne Bay, Florida; Biscayne National Park, Florida; and the Florida Keys National Marine Sanctuary. In addition, the Council through CEBA 2 (SAFMC 2011) designated the Deep-water Coral HAPCs as EFH-HAPCs under the Coral FMP as follows:

Deep-water Coral HAPCs designated in Comprehensive Ecosystem-Based Amendment 1 as Snapper Grouper EFH-HAPCs: Cape Lookout Coral HAPC, Cape Fear Coral HAPC, Blake Ridge Diapir Coral HAPC, Stetson-Miami Terrace Coral HAPC, and Pourtalés Terrace Coral HAPC.

Dolphin and Wahoo FMP

EFH for dolphin and wahoo is the Gulf Stream, Charleston Gyre, Florida Current, and pelagic *Sargassum*. This EFH definition for dolphin was approved by the Secretary of Commerce on June 3, 1999 as a part of the Council's Comprehensive Habitat Amendment (SAFMC 1998b) (dolphin was included within the Coastal Migratory Pelagics FMP at that time).

Areas which meet the criteria for EFH-HAPCs for dolphin and wahoo in the Atlantic include The Point, The Ten-Fathom Ledge, and Big Rock (North Carolina); The Charleston Bump and The Georgetown Hole (South Carolina); The Point off Jupiter Inlet (Florida); The Hump off Islamorada, Florida; The Marathon Hump off Marathon, Florida; The "Wall" off of the Florida Keys; and Pelagic *Sargassum*. This EFH-HAPC definition for dolphin was approved by

the Secretary of Commerce on June 3, 1999 as a part of the Council's Comprehensive Habitat Amendment (dolphin was included within the Coastal Migratory Pelagics FMP at that time).

Pelagic *Sargassum* Habitat FMP

The Council through CEBA 2 (SAFMC 2011) designated the top 10 meters of the water column in the South Atlantic EEZ bounded by the Gulfstream, as EFH for pelagic Sargassum.

Actions Implemented That Protect EFH and EFH-HAPCs

Snapper Grouper FMP

- Prohibited the use of the following gear to protect habitat: bottom longlines in the EEZ inside of 50 fathoms or anywhere south of St. Lucie Inlet, Florida; bottom longlines in the wreckfish fishery; fish traps; bottom tending (roller- rig) trawls on live bottom habitat; and entanglement gear.
- Established the *Oculina* Experimental Closed Area where the harvest or possession of all species in the snapper grouper complex is prohibited.
- Established deep-water Marine Protected Areas (MPAs) as designated in Snapper Grouper Amendment 14: Snowy Grouper Wreck MPA, Northern South Carolina MPA, Edisto MPA, Charleston Deep Artificial Reef MPA, Georgia MPA, North Florida MPA, St. Lucie Hump MPA, and East Hump MPA.

Shrimp FMP

- Prohibition of rock shrimp trawling in a designated area around the *Oculina* Bank,
- Mandatory use of bycatch reduction devices in the penaeid shrimp fishery,
- Mandatory Vessel Monitoring System (VMS) in the Rock Shrimp Fishery.
- A mechanism that provides for the concurrent closure of the EEZ to penaeid shrimping if environmental conditions in state waters are such that the overwintering spawning stock is severely depleted.

***Pelagic Sargassum* Habitat FMP**

- Prohibited all harvest and possession of *Sargassum* from the South Atlantic EEZ south of the latitude line representing the North Carolina/South Carolina border (34° North Latitude).
- Prohibited all harvest of *Sargassum* from the South Atlantic EEZ within 100 miles of shore between the 34° North Latitude line and the Latitude line representing the North Carolina/Virginia border.
- Harvest of *Sargassum* from the South Atlantic EEZ is limited to the months of November through June.
- Established an annual Total Allowable Catch (TAC) of 5,000 pounds landed wet weight.
- Required that an official observer be present on each *Sargassum* harvesting trip. Require that nets used to harvest *Sargassum* be constructed of four-inch stretch mesh or larger fitted to a frame no larger than 4 feet by 6 feet.

Coastal Migratory Pelagics FMP

- Prohibited of the use of drift gillnets in the coastal migratory pelagic fishery.

Golden Crab FMP

- In the northern zone, golden crab traps can only be deployed in waters deeper than 900 feet; in the middle and southern zones traps can only be deployed in waters deeper than 700 feet.

Northern zone - north of the 28°N. latitude to the North Carolina/Virginia border;
Middle zone - 28°N. latitude to 25° N. latitude; and
Southern zone - south of 25°N. latitude to the border between the South Atlantic and Gulf of Mexico Fishery Management Councils.

Coral, Coral Reefs and Live/Hard Bottom FMP

- Established an optimum yield of zero and prohibiting all harvest or possession of these resources which serve as essential fish habitat to many managed species.
- Designated the *Oculina* Bank Habitat Area of Particular Concern.
- Expanded the *Oculina* Bank Habitat Area of Particular Concern (HAPC) to an area bounded to the west by 80°W. longitude, to the north by 28°30' N. latitude, to the south by 27°30' N. latitude, and to the east by the 100 fathom (600 feet) depth contour.
- Established the following two Satellite *Oculina* HAPCs: (1) Satellite *Oculina* HAPC #1 is bounded on the north by 28°30'N. latitude, on the south by 28°29'N. latitude, on the east by 80°W. longitude, and on the west by 80°3'W. longitude; and (2) Satellite *Oculina* HAPC #2 is bounded on the north by 28°17'N. latitude, on the south by 28°16'N. latitude, on the east by 80°W. longitude, and on the west by 80°3'W. longitude.
- Prohibited the use of all bottom tending fishing gear and fishing vessels from anchoring or using grapples in the *Oculina* Bank HAPC.
- Established a framework procedure to modify or establish Coral HAPCs.
- Established the following five deep-water CHAPCs:

Cape Lookout Lophelia Banks CHAPC;
Cape Fear Lophelia Banks CHAPC;
Stetson Reefs, Savannah and East Florida Lithoherms, and Miami Terrace (Stetson- Miami Terrace) CHAPC;
Pourtales Terrace CHAPC; and
Blake Ridge Diapir Methane Seep CHAPC.

- Within the deep-water CHAPCs, the possession of coral species and the use of all bottom damaging gear are prohibited including bottom longline, trawl (bottom and mid-water), dredge, pot or trap, or the use of an anchor, anchor and chain, or grapple and chain by all fishing vessels.

Council Policies for Protection and Restoration of Essential Fish Habitat
SAFMC Habitat and Environmental Protection Policy

In recognizing that species are dependent on the quantity and quality of their essential habitats, it is the policy of the SAFMC to protect, restore, and develop habitats upon which fisheries species depend; to increase the extent of their distribution and abundance; and to improve their productive capacity for the benefit of present and future generations. For purposes of this policy, "habitat" is defined as the physical, chemical, and biological parameters that are necessary for continued productivity of the species that is being managed. The objectives of the SAFMC policy will be accomplished through the recommendation of no net loss or significant environmental degradation of existing habitat. A long-term objective is to support and promote a net-gain of fisheries habitat through the restoration and rehabilitation of the productive capacity of habitats that have been degraded, and the creation and development of productive habitats where increased fishery production is probable. The SAFMC will pursue these goals at state, Federal, and local levels. The Council shall assume an aggressive role in the protection and enhancement of habitats important to fishery species, and shall actively enter Federal, decision making processes where proposed actions may otherwise compromise the productivity of fishery resources of concern to the Council.

SAFMC EFH Policy Statements

In addition to implementing regulations to protect habitat from fishing related degradation, the Council in cooperation with NOAA Fisheries, actively comments on non-fishing projects or policies that may impact fish habitat. The Council adopted a habitat policy and procedure document that established a four-state Habitat Advisory Panel and adopted a comment and policy development process. Members of the Habitat Advisory Panel serve as the Council's habitat contacts and professionals in the field. With guidance from the Advisory Panel, the Council has developed and approved a number of habitat policy statements which are available on the Habitat and Ecosystem section of the Council website (http://www.safmc.net/ecosystem/Home/EcosystemHome/tabid/435/Default.aspx).

References:

SAFMC (South Atlantic Fishery Management Council). 1998a. Habitat Plan for the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Cir., Ste 306, Charleston, S.C. 29407-4699.

SAFMC (South Atlantic Fishery Management Council). 1998b. Comprehensive Amendment Addressing Essential Fish Habitat in Fishery Management Plans of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Cir., Suite 306, Charleston, S.C. 29407-4699.

SAFMC (South Atlantic Fishery Management Council). 2009a. Fishery Ecosystem Plan for the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2009b. Comprehensive Ecosystem-

Based Amendment 1 for the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Suite 201; North Charleston, SC 29405.

SAFMC (South Atlantic Fishery Management Council). 2011. Comprehensive Ecosystem-Based Amendment 2 for the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Suite 201; North Charleston, SC 29405.

Wenner, E. L., G. F. Ulrich, and J. B. Wise. 1987. Exploration for golden crab, Geryon fenneri, in the south Atlantic Bight: distribution, population structure, and gear assessment. Fishery Bulletin 85:547-560.

Appendix I. Small Craft Advisories Seasonality and Periodicity

Introduction

The Council has expressed concern that fishing opportunities could be lost if bad weather occurs during the red snapper recreational mini seasons. Weather that can affect fishing includes rain and other precipitation as well as ocean conditions determined by wave height, wave period (frequency), and wind. This analysis uses criteria used by the US Coast Guard to issue small craft advisories. Small craft advisories are issued for sustained winds or frequent gusts between 25 to 33 knots and/or 5- to 7-foot seas and greater for areas off the Carolinas, or if sustained winds of 20 to 33 knots and/or forecast seas 7 feet or greater are expected for more than two hours from Georgia to Florida[12].

Wave height alone does not necessarily predict a bad day on the water, however. Wave period should be considered with wave height for a better assessment of the conditions. For example, a day with 4-foot seas and wave period greater than 7-seconds may not be considered a bad day, but a day with 4-foot seas and a 2-second wave period would be very rough. Wind speed is also used to issue small craft advisories. Data on wind speed is collected from many marine data buoys and archived by NOAA. These data could be used as a proxy for weather that can affect fishing activity. For consistency among areas and in the interest of promoting safety at sea, this analysis considers wind speeds 20 knots or greater as the threshold for a small craft advisory or "bad weather". This analysis does not consider other factors such as wave height, rain, or lighting which can also contribute to a bad weather day.

Data

Data were pulled from the National Buoy Data Center[13] for buoys off the Florida, North Carolina, and South Carolina coasts. **Table I-1** provides general information on the buoys that were queried and the percent of days that reported wind speed from 2015 to 2018. Data buoys shown in bold in **Table I-1** were used to estimate bad weather days from 2015 to 2018. Other buoys were investigated but not included in the analysis. Wind speed (labelled WSPD in the data set) is the average wind speed reported over an eight-minute period. Wind speed data were explored in two different ways to identify "bad weather days" and to avoid potential biases[14]: maximum wind speed (not gusts) for the day and daily average. When a wind event was identified, it was associated with the first day that it occurred (event could cross months).

---

[12] https://coastguard.dodlive.mil/2009/10/small-craft-advisories-and-boating-safety/
[2] National Data Buoy Center website: ndbc.noaa.gov accessed on August 13, 2019
[14] Maximum wind speed will be biased high because it is only looking for maybe a small block of time that exceeded the level. The overall conditions for the day might not have been that bad. A thunderstorm could spike the winds. Average might be biased low because everything is smoothed out.

Note: This analysis does not test differences statistically. Preparing the data for a statistical analysis would average out some of the data points. Instead, data from all stations (different areas in the management region) are shown because bad weather may not occur throughout the region.

Table I-1. Marine data buoys and general location. Data buoys shown in bold were used to estimate bad weather days from 2015 to 2018. Other buoys were investigated but not included in the analysis. The percentage is the percent of days with wind speed reported.

Buoy Name	General Location	2015	2016	2017	2018
41009	**20 miles E of Cape Canaveral, FL**	**100%**	**77%**	**70%**	**100%**
41004	**41 miles E of Charleston, SC**	**100%**	**100%**	**100%**	**100%**
41013	Frying Pan Shoals	Investigated limited data			
41037	**E of Wrightsville Beach, NC**	**88%**	**99%**	**100%**	**99%**
41117	off St Augustine, FL	Investigated limited data			
41159	E of Wilmington, NC	Investigated limited data			
SANF1	**off Sand Key, FL**	**92%**	**100%**	**65%**	**2%**
SMKF1	**off Sombrero Key, FL**	**61%**	**0%**	**0%**	**57%**

Results

Maximum Wind Speed

Maximum wind speeds ranged from 1 knot to 56 knots. Two-thirds of the total number of days for which data were available had maximum wind speed that met the criteria for small craft conditions (above 20 knots). The longest number of consecutive days with small craft conditions was 14 days.

Typically, from 2015 to 2018, 10 to 20 percent of the days (3 to 6 days) from June to August had maximum winds of 20 knots or greater in all locations (**Figure I-1**). Outside of these months the percent of days with winds over 20 knots increased to over 50%. Sombrero Key station had a low point in November. Although Sombrero Key station had limited data in 2015 and 2018, it was included in the analysis because the Sand Key station was missing wind speed data for most of 2018. Because the same general trend was present in all locations, the remaining figures (**Figures I-2 to I-6**) present data grouped over all stations.

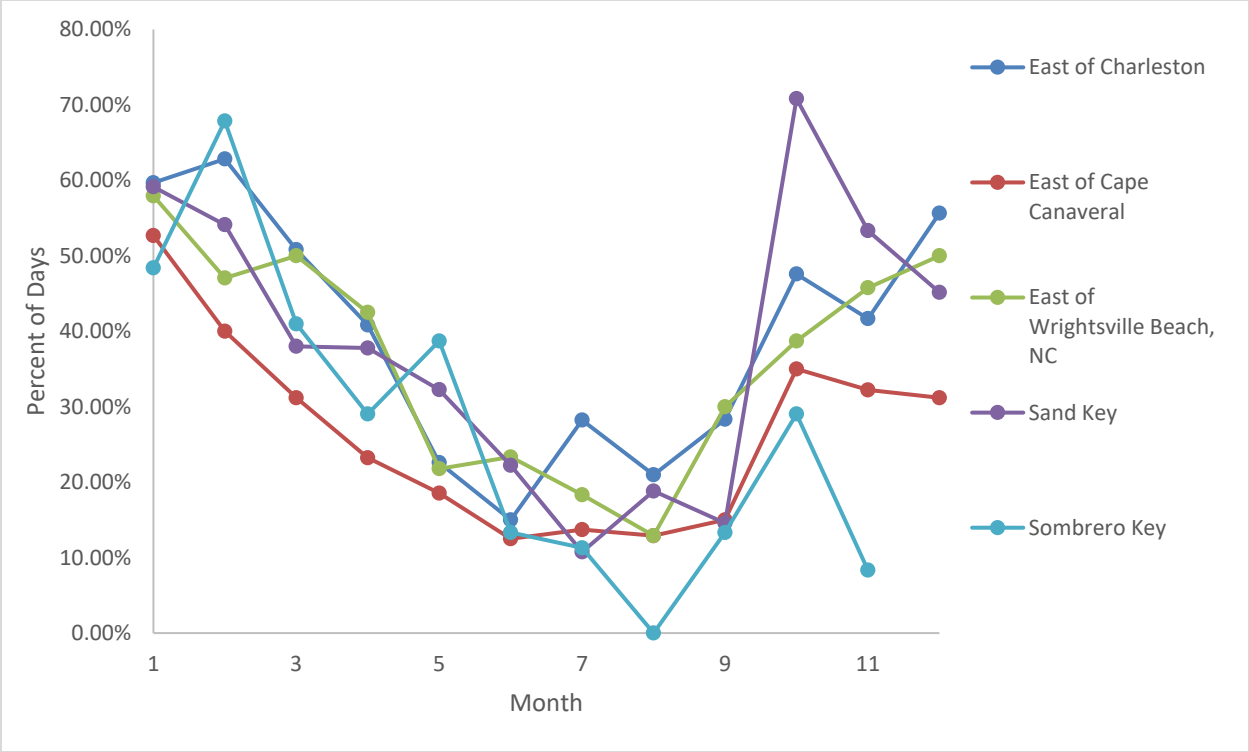


Figure I-1. Percent of days from 2015 to 2018 with maximum wind speed of 20 knots or greater by station indicating small craft advisory conditions. The small craft advisory conditions were based on wind speed to issue a small craft advisory from Georgia to Florida by the US Coast Guard. Source: National Data Buoy Center.

Through the time series examined, July had the fewest days with maximum winds of 20 knots or above (**Figure I-2**). On average, 5 days per month would be considered unsafe for fishing activity to take place. Exceptions occurred in 2015 and 2018, when the smallest percent of days with maximum winds of 20 knots or higher occurred in June and August, respectively. In general, there is a steady decline from January to June in the number of days with small craft advisory conditions. The number of days increases sharply from August to October and then levels out from October to December.

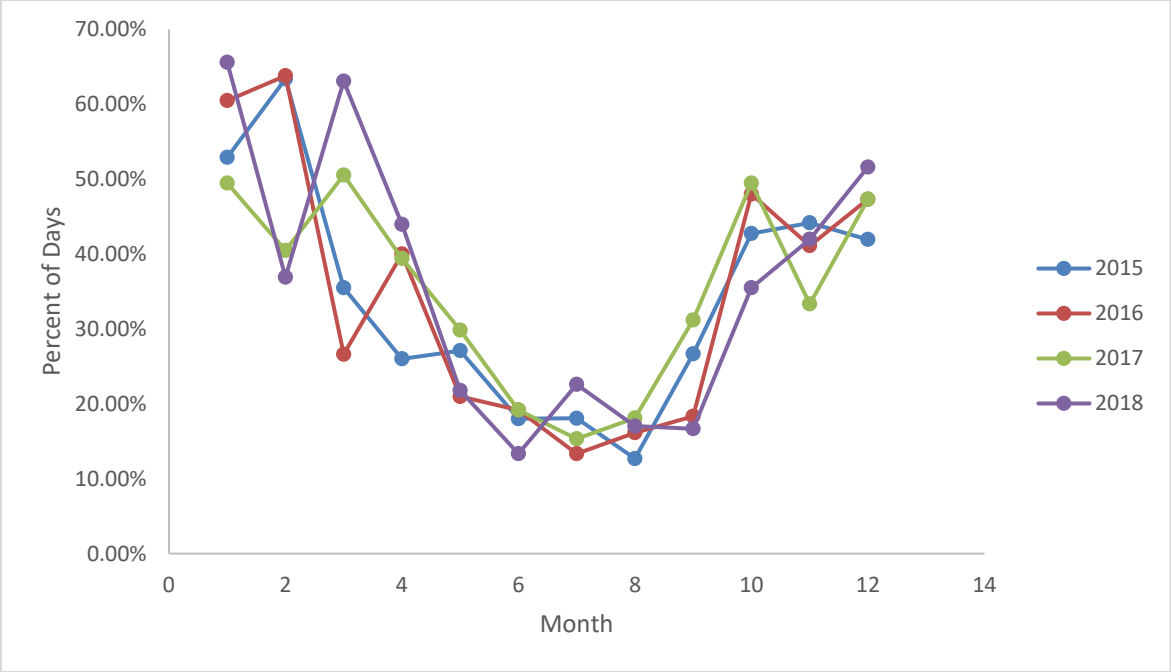


Figure I-2. Percent of days with maximum wind speed of 20 knots or greater by year indicating small craft advisory conditions from 2015 to 2018. The small craft advisory conditions were based on wind speed to issue a small craft advisory from Georgia to Florida by the US Coast Guard. Source: National Data Buoy Center.

Another important factor in determining the favorability of fishing conditions is how long the small craft advisory conditions persist. Each day that met the small craft advisory conditions (maximum wind speed > 20 knots) was identified and consecutive days were grouped into an event. Events were observed lasting from one to fourteen days (no small craft conditions were considered an event in calculating the percent of events). The lowest percent of events occurred from June to September (**Figure I-3**). The small craft advisory conditions lasted one day in greater than 50% of the events from June to August. The percent of events lasting two days or more increased to over 50% in September. All other months had greater than 50% of the events lasting two or more days with almost two-thirds of the events lasting two or more days from November to March. January is the worst month in percent of events and duration of the events.

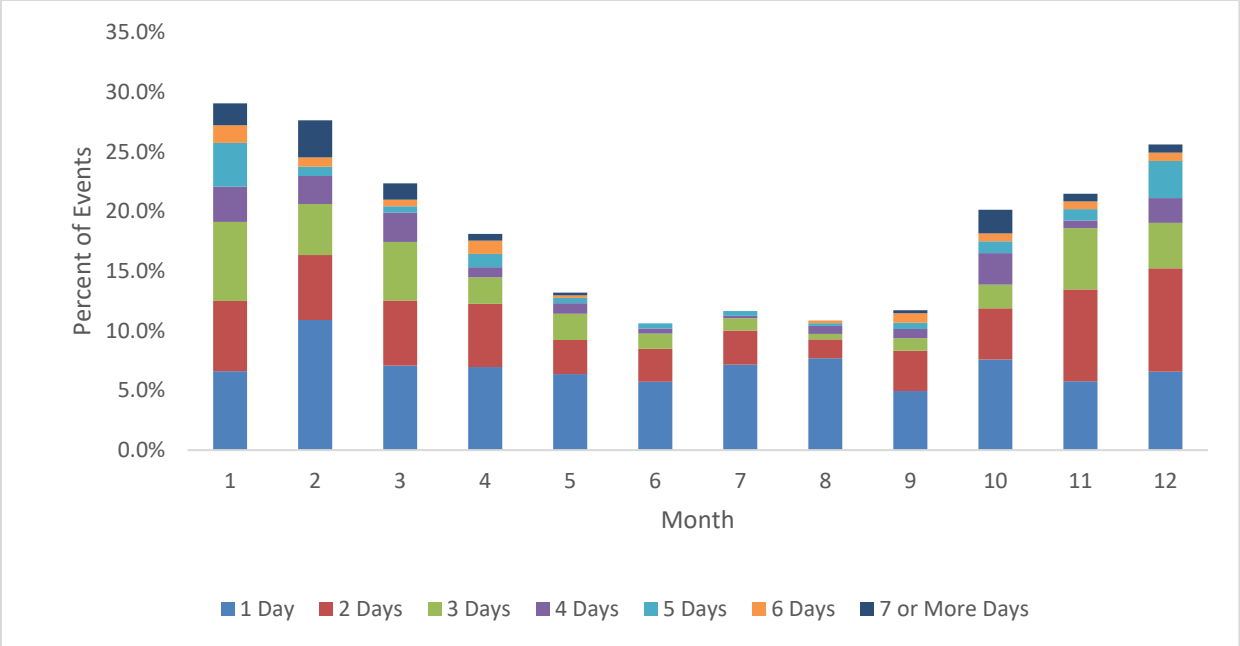


Figure I-3. Percent of events with maximum wind speed greater than or equal to 20 knots in the South Atlantic region from 2015 to 2018 by month. An event is a day or group of consecutive days with small craft advisory conditions (indicated by colors on the graph). Each day without a small craft advisory was considered an event (not plotted but used to calculate the percent for each month). The small craft advisory conditions were based on wind speed to issue a small craft advisory from Georgia to Florida by the US Coast Guard. Source: National Data Buoy Center.

Average Wind Speed

A lower percent of days met the criteria for small craft advisories using average wind speed compared to maximum wind speed. Seven percent (2 days per month) had an average wind speed 20 knots or higher. The longest number of consecutive days with small craft advisory conditions was seven days. The percent of days with average wind speed of 20 knots and above was between 0% to 23% by station (**Figure I-4**). There was a general trend decreasing from January to June and then increasing from August to December. The lowest percent occurred from June to August at most stations. Sombrero Key station had a low point in November. Sombrero Key station had limited data in 2015 and 2018 but was included because the Sand Key station was missing wind speed data for most of 2018.

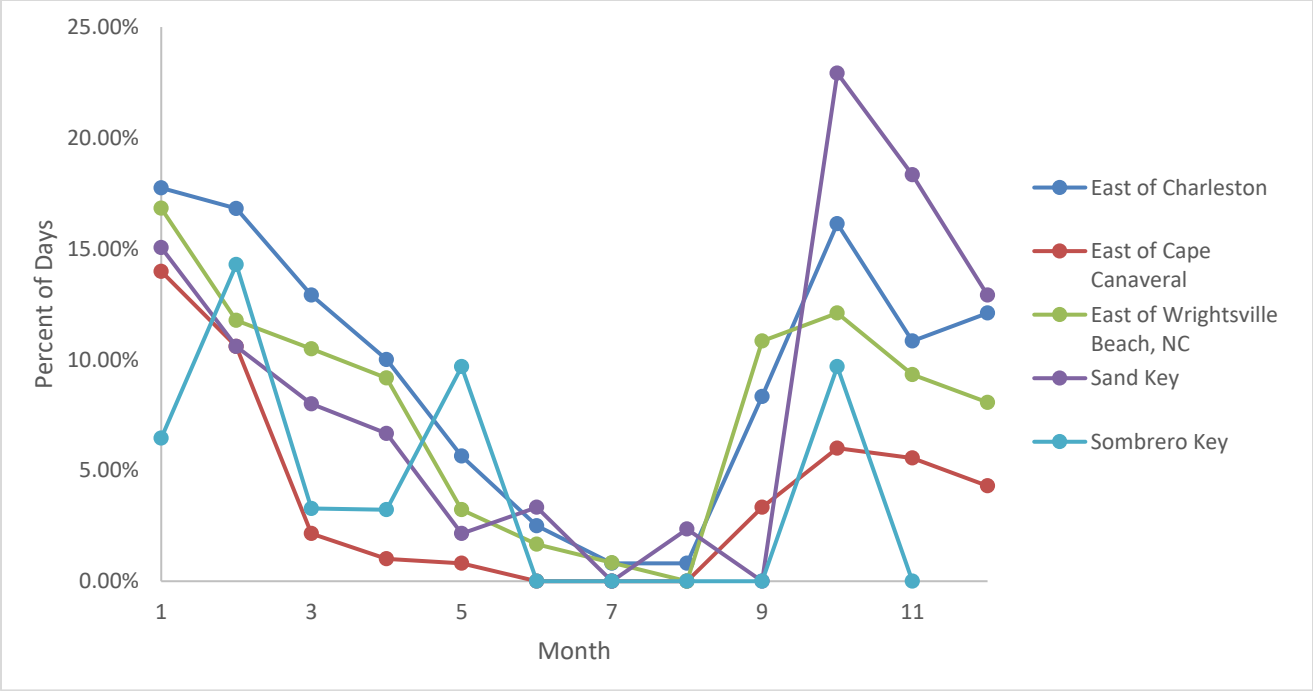


Figure I-4. Percent of days from 2015 to 2018 with average wind speed of 20 knots or greater by station. The average wind speed was based on wind speed to issue a small craft advisory from Georgia to Florida by the US Coast Guard. Source: National Data Buoy Center.

June, July, and August had the lowest percentage of days with average wind speeds 20 knots or higher (**Figure I-5**). In some years, there were no days or very few days from June to August with average wind speeds meeting the small craft advisory conditions. In general, there was a declining trend in percent of days meeting the small craft advisory conditions from January to June and then an increasing trend from August to October. The number of days was somewhat level from October to December ranging from 5% to 12%, except for a peak in October 2016.

If average wind speed met small craft advisory conditions (> 20 knots), the day was identified as an event. If the events fell on consecutive days, the days were grouped into a single event. Each day that did not meet the small craft advisory conditions was identified as an event. The months with the lowest percent of events meeting the criteria for small craft advisory were July and August (**Figure I-6**). January and February had the highest percent of events with over 10% of the events meeting the criteria. Importantly, most events lasted only one day except for those during May and September when the events were typically two days or longer.

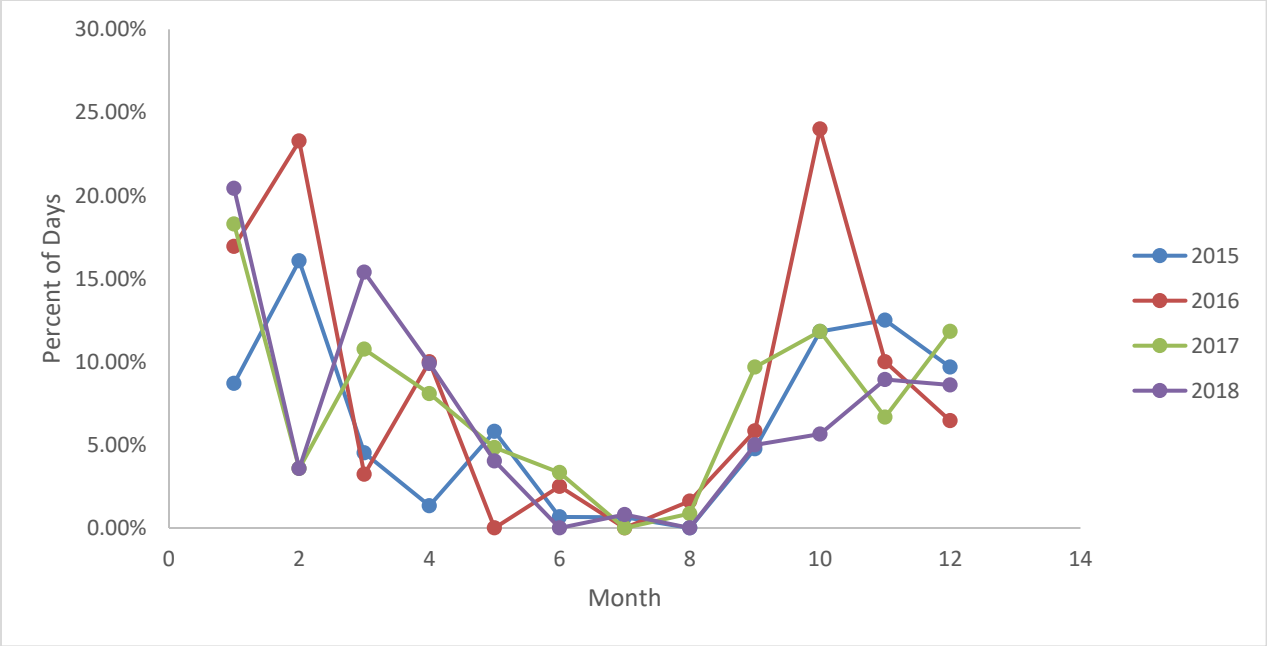


Figure I-5. Percent of days with average wind speed of 20 knots or greater by year indicating small craft advisory conditions from 2015 to 2018. The small craft advisory conditions were based on wind speed to issue a small craft advisory from Georgia to Florida by the US Coast Guard. Source National Data Buoy Center.

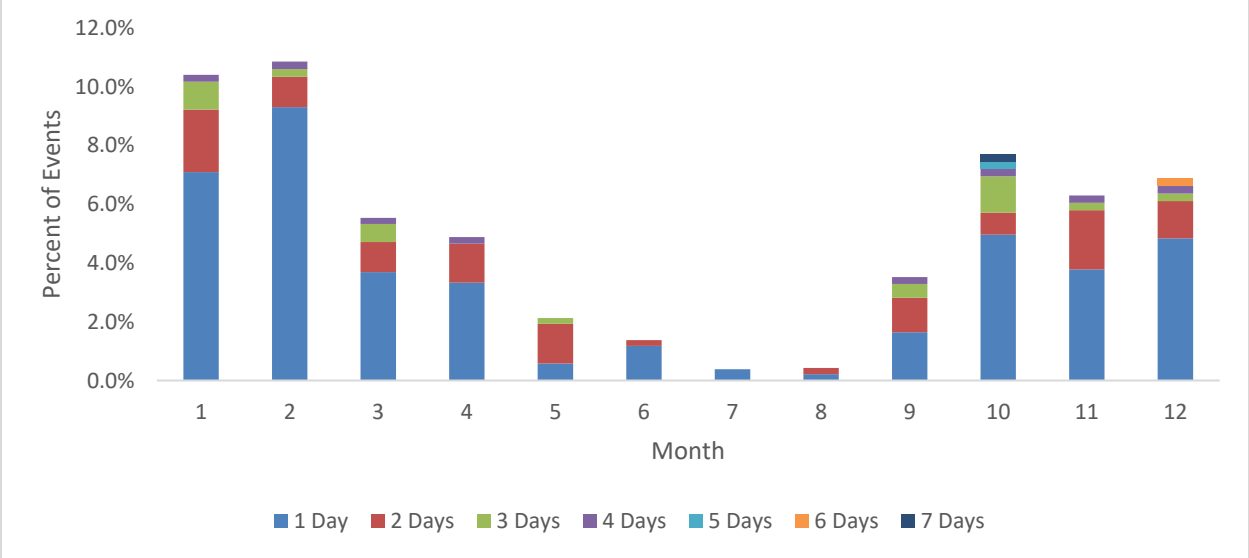


Figure I-6. Percent of events with average wind speed 20 knots or higher in the South Atlantic region from 2015 to 2018 by month. An event is a day or group of consecutive days with small craft advisory conditions (indicated by colors on the the graph). Each day without a small craft advisory was considered an event (not plotted but used to calculate the percent for each month). The small craft advisory conditions were based on wind speed to issue a small craft advisory from Georgia to Florida by the US Coast Guard. Source: National Data Buoy Center.

Correlation of Weather Condition Among Days

A correlations analysis was conducted to see if "weather today is more like weather tomorrow than next week". This was done to get an idea of weather patterns since the Council expressed concern that if the first opening of the red snapper season is compromised due to weather, the remainder of the season might also be affected. Spreading the allowable fishing days over a longer time period might ensure fishermen have a chance to fish on at least one day. Maximum wind speed and average wind speed were used to develop correlations for stations 41004 (SC), 41037 (NC), and 41009 (FL) because they had more continuous data than the other stations (Table 1) and continuous data are important for describing correlation. Because there were some continuous missing data, data for station 41037 were truncated to March 1, 2015 through December 31, 2018 and data for station 41009 were truncated to January 1, 2015 to October 7, 2016 (early) and April 22, 2017 to December 31, 2018 (late).

Correlations were developed for the original date, one day later, and one week later. Correlations can range between -1 and 1. A positive value indicated the two time periods were related to each other and had similar changes (both increasing or decreasing wind speeds). Negative values indicated the two time periods were related to each other, but the trends were opposite (when one increased, the other decreased). A value close to zero indicated the values are not related to each other and trends were not related.
The maximum wind speed for the original day compared with one day later and one week later had positive correlations with the one day later having a much stronger correlation to the original value than the week later (closer to 1). As expected, the maximum wind speed one day later was more likely to be like the previous day than one week later (**Table I-2**). The correlations one week later were very weak meaning the maximum wind speed one week later was unrelated to the previous week. Average wind speed correlation results (**Table I-3**) were similar to the maximum wind speed correlations. The results of the correlation can be interpreted in two ways: If there is bad weather today, you will likely have bad weather tomorrow and if there is good weather today, there will likely be good weather tomorrow. Combining this with previous information on the length of small craft advisory events, June, July, and August are likely to have shorter events lasting only one day whereas small craft advisories can last for multiple days from September through May.

Table I-2. Correlations between maximum wind speeds from the original date (Max) and one day (Max1) and one week later (Max7) for stations 41004, 41037, and 41009. Correlations for station 41009 were split due to a lack of wind speed data into early (January 1, 2015 to October 7, 2016) and late (April 22, 2017 to December 31, 2018).

	41004 Max	**41004 Max1**	**41004 Max7**
41004 Max	1		
41004 Max1	0.5197	1	
41004 Max7	0.0596	0.0698	1

	41037 Max	**41037 Max1**	**41037 Max7**
41037 Max	1		
41037 Max1	0.5216	1	
41037 Max7	0.057	0.0992	1

	41009 Max Early	**41009 Max1 Early**	**41009 Max7 Early**
41009 Max Early	1		
41009 Max1 Early	0.5357	1	
41009 Max7 Early	0.1317	0.0913	1

	41009 Max Late	**41009 Max1 Late**	**41009 Max7 Late**
41009 Max Late	1		
41009 Max1 Late	0.4907	1	
41009 Max7 Late	0.1089	0.0614	1

Source: National Data Buoy Center

Table I-3. Correlations between average wind speeds from the original date (Avg) and one day (Avg1) and one week later (Avg7) for stations 41004, 41037, and 41009. Correlations for station 41009 were split due to a lack of wind speed into early (January 1, 2015 to October 7, 2016) and late (April 22, 2017 to December 31, 2018).

	41004 Avg	**41004 Avg1**	**41004 Avg7**
41004 Avg	1		
41004 Avg1	0.5239	1	
41004 Avg7	0.0553	0.0753	1

	41037 Avg	**41037 Avg1**	**41037 Avg7**
41037 Avg	1		
41037 Avg1	0.5094	1	
41037 Avg7	0.0159	0.0473	1

	41009 Avg Early	**41009 Avg1 Early**	**41009 Avg7 Early**
41009 Avg Early	1		
41009 Avg1 Early	0.3574	1	
41009 Avg7 Early	0.202	0.1857	1

	41009 Avg Late	**41009 Avg1 Late**	**41009 Avg7 Late**
41009 Avg Late	1		
41009 Avg1 Late	0.6366	1	
41009 Avg7 Late	0.1699	0.1825	1

Source: National Data Buoy Center