Vision Blueprint Commercial Regulatory Amendment 27

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

Address specific action items in the 2016-2020 Vision Blueprint for the Commercial Sector of the Snapper Grouper Fishery of the South Atlantic Region.

May 15, 2018 DRAFT

South Atlantic Fishery Management Council
4055 Faber Place Drive; Suite 201
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Award Number FNA15NMF4410010

Abbreviations and Acronyms Used in the FMP

ABC acceptable biological catch

ACL annual catch limits

AM accountability measures

ACT annual catch target

B a measure of stock biomass in either weight or other appropriate unit

B_{MSY} the stock biomass expected to exist under equilibrium conditions when fishing at F_{MSY}

B_{OY} the stock biomass expected to exist under equilibrium conditions when fishing at F_{OY}

B_{CURR} the current stock biomass

CPUE catch per unit effort

DEIS draft environmental impact statement

EA environmental assessment

EEZ exclusive economic zone

EFH essential fish habitat

F a measure of the instantaneous rate of fishing mortality

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

F_{CURR} the current instantaneous rate of fishing mortality

F_{MSY} the rate of fishing mortality expected to achieve MSY under equilibrium conditions and a corresponding biomass of B_{MSY}

F_{OY} the rate of fishing mortality expected to achieve OY under equilibrium conditions and a corresponding biomass of B_{OY}

FMP fishery management plan

FMU fishery management unit

M natural mortality rate

MARMAP Marine Resources Monitoring Assessment and Prediction Program

MFMT maximum fishing mortality threshold

MMPA Marine Mammal Protection Act

MRFSS Marine Recreational Fisheries Statistics Survey

MRIP Marine Recreational Information Program

MSFCMA Magnuson-Stevens Fishery Conservation and Management Act

MSST minimum stock size threshold

MSY maximum sustainable yield

NEPA National Environmental Policy Act

NMFS National Marine Fisheries Service

NOAA National Oceanic and Atmospheric Administration

OFL overfishing limit

OY optimum yield

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

Vision Blueprint Commercial Regulatory Amendment 27 for the Snapper Grouper Fishery of the South Atlantic Region

Proposed action:	The actions are to modify commercial regulations such as fishing seasons, trip limits, seasonal closures, and minimum size limits for species in the snapper grouper fishery.
Lead agency:	FMP Actions – South Atlantic Fishery Management Council Environmental Assessment – National Marine Fisheries Service (NMFS) Southeast Regional Office
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Table of Contents

List of Appendices

List of Tables

List of Figures

Summary

Why is the South Atlantic Council considering action?

The Vision Blueprint Regulatory Amendment 27 (Regulatory Amendment 27) to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP) addresses specific action items in the 2016-2020 Vision Blueprint for the Snapper Grouper Fishery of the South Atlantic Region (Vision Blueprint) for the commercial sector. The Vision Blueprint identifies the goals, objectives, strategies, and actions that support the vision for the snapper grouper fishery and centers around four goal areas - Science, Management, Communication, and Governance. During a series of stakeholder meetings in 2014, the South Atlantic Fishery Management Council (Council) gathered input from commercial fishermen from throughout the region. In 2015, the Council prioritized action items that would be addressed through amendments to the Snapper Grouper FMP over the next five years. The Council chose to focus on actions that would address "seasonality" and "retention" in the fishery and began development of two amendments to address the commercial and recreational sectors, respectively. Regulatory Amendment 27 includes modifications to commercial management measures based on stakeholder input and intended to allow equitable access and minimize discards.

The use of split seasons for the commercial sector is addressed under the Vision Blueprint's Strategy 2.3 - *Support development of management approaches that account for the seasonality of the snapper grouper fishery*. One of the priority actions under that strategy states *Expand the use of split seasons for the commercial fishery.* The intent is to "line up" harvest for species that are often caught together to level out accessibility in different areas and to reduce regulatory discards. Factors such as distance to fishing grounds and weather/temperature affect availability of some species to the commercial fleets in different parts of the Council's jurisdiction. Actions 1 through 4 consider split seasons for blueline tilefish, snowy grouper, greater amberjack, and red porgy, respectively.

The use of trip limits for the commercial sector is addressed under the Vision Blueprint's Strategy 2.1 – *Support development of management approaches that address retention of snapper grouper species*. The first priority action under this strategy is to consider trip limit adjustments for the commercial sector to lengthen seasons and better utilize annual catch limits. Modification to trip limits for blueline tilefish, greater amberjack, red porgy and vermilion snapper are considered under Actions 1, 3, 4 and 5, respectively. Specifying a trip limit for the Other Jacks Complex is addressed in Action 7.

The use of seasonal closures to manage the snapper grouper fishery is addressed under the Vision Blueprint's Strategy 1.3 - *Consider use of alternative sub-regional management strategies that are not quota-based.* The first priority under this strategy is to use staggered spawning season closures to address latitudinal differences in spawning activity. In addition, under "Hot Topic" items, the Vision Blueprint identifies adjusting the seasonal spawning closure for shallow water groupers. The Council considered making modifications to the shallow water grouper closure for both the commercial and recreational sectors early on in the development of this amendment and in Vision Blueprint Recreational Regulatory Amendment 26, respectively. However, based on input from advisors and stakeholders, the Council is now considering only modifying the seasonal closure for red grouper off the Carolinas (Action 8).

Removal of size limits for deepwater species is addressed in the Vision Blueprint Strategy 4.2 (in Appendix B) -- *Consider management approaches that address the impact of depth on bycatch of snapper grouper species.* Three deep-water snapper – silk snapper, queen snapper, and blackfin snapper – are managed under a 12-inch total length minimum size limit in federal waters. These size limits were put in place long ago, before estimates of discard mortality were available and long before the creation of the various Complexes. Species in the Deepwater Complex are typically associated with high discard mortality. To curb discard losses, the Council is considering action to eliminate minimum size limit requirements for these deepwater species in Action 9. Actions 6 and 10 address minimum size limits for almaco jack and gray triggerfish, respectively. The former had been suggested by stakeholders and Council advisors as a conservative measure for the commercial sector.

The commercial minimum size limit for gray triggerfish was modified in 2015 through implementation of Snapper Grouper Amendment 29. A commercial minimum size limit of 12 inches fork length was implemented in federal waters off North Carolina, South Carolina, and Georgia, and a commercial minimum size limit of 14 inches FL was put in place in federal waters off east Florida. This was precautionary action in response to concerns about the status of the gray triggerfish stock in the South Atlantic and to align regulations with those in the Gulf of Mexico. However, after the new minimum size limit went into effect (on July 1, 2015), stakeholders in Florida voiced concern to the Florida Fish and Wildlife Conservation Commission (FWC) regarding increasing discards of gray triggerfish in south Florida where the average size of gray triggerfish is smaller than that off northeast Florida. In response, the FWC reduced the recreational minimum size limit of gray triggerfish to 12 inches FL in 2017 and requested that the Council follow suit in issuing consistent regulations.

What actions are being proposed in this amendment?

Vision Blueprint Commercial Regulatory Amendment 27 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP) proposes the following 10 actions for snapper grouper species in the South Atlantic Region:

Will be revised after Council makes changes in June

1. **Establish a commercial split season and modify the commercial trip limit for blueline tilefish**

   Currently: The commercial fishing year for blueline tilefish in the South Atlantic EEZ is from January 1 to December 31 and commercial harvest is restricted to 300 pounds gutted weight per trip.

   Preferred Alternative 3. Retain the January 1 through December 31 commercial fishing year for blueline tilefish in the South Atlantic exclusive economic zone. Modify the commercial trip limit for blueline tilefish:

   Preferred Sub-alternative 3a. 100 pounds gutted weight from January 1 through April 30 and 300 pounds gutted weight from May 1 through December 31.

2. **Establish a commercial split season for snowy grouper**

   Currently: The commercial fishing year for snowy grouper in the South Atlantic federal waters is from January 1 to December 31.

   Preferred Alternative 3. Specify two commercial fishing seasons for snowy grouper. Allocate the snowy grouper commercial annual catch limit into two quotas: 70% to the period January 1 through June 30 and 30% to the period July 1 through December 31. Any remaining quota from Season 1 would transfer to Season 2. Any remaining quota from Season 2 would not be carried forward.

3. **Establish a commercial split season and modify the commercial trip limit for greater amberjack**

   Currently: The commercial fishing year for greater amberjack in the South Atlantic federal waters is from March 1 to the end of February. During April each year, no person may sell or purchase greater amberjack harvested from the South Atlantic exclusive economic zone, and the harvest and possession limit is one per person per day or one per person per trip, whichever is more restrictive. The commercial trip limit in March and from May through the end of February each fishing year is 1,200 pounds whole weight.

   Preferred Alternative 2. Specify two commercial fishing seasons for greater amberjack. Allocate the commercial annual catch limit for greater amberjack into two quotas: 50% to the period March 1 through August 31 and 50% to the period September 1 through the end of February. Any remaining quota from Season 1 would transfer to Season 2. Any remaining quota from Season 2 would not be carried forward. During April each year, no person may sell or purchase a greater amberjack harvested from the South Atlantic exclusive economic zone.

Preferred Sub-alternative 2c. Trip limit equals 1,000 pounds whole weight in both seasons.

4. Establish a commercial split season and modify commercial trip limit for red porgy

Currently: The commercial fishing year for red porgy in the South Atlantic exclusive economic zone is from January 1 to December 31. During January 1 through April 30 each year, no person may sell or purchase red porgy harvested from the South Atlantic exclusive economic zone, and the harvest and possession limit is three per person per day or three per person per trip, whichever is more restrictive. From May 1 through December 31 each year, the trip limit for red porgy is 120 fish.

Preferred Alternative 2. Specify two commercial fishing seasons for red porgy. Allocate the commercial red porgy annual catch limit into two quotas: 30% to the period January 1 through April 30 and 70% to the period May 1 through December 31. Any remaining quota from Season 1 would transfer to Season 2. Any remaining quota from Season 2 would not be carried forward. Remove the sale and purchase prohibition during January 1 to April 30 each year. Retain the commercial trip limit of 120 fish from May 1 through December 31 and specify a commercial trip limit from January 1 through April 30 of:

Preferred Sub-alternative 2c. 60 fish

5. Modify the commercial trip limit for vermilion snapper

Currently: The commercial fishing year for vermilion snapper in the South Atlantic exclusive economic zone is from January 1 to December 31. The commercial annual catch limit is split into two quotas: 50% to the period January 1 through June 30 and 50% to the period July 1 through December 31. Any remaining quota from Season 1 transfers to Season 2. Any remaining quota from Season 2 is not carried forward. The commercial trip limit for vermilion snapper in the South Atlantic exclusive economic zone is 1,000 pounds gutted weight. For both seasons, when 75% of the vermilion snapper seasonal quota is met or is projected to be met, the trip limit is reduced to 500 pounds gutted weight.

The Council has not selected a preferred alternative for this action

6. Establish a minimum size limit for almaco jack for the commercial sector

Currently: There is no commercial minimum size limit specified for almaco jack.

Preferred Alternative 2. Establish a minimum size limit for almaco jack for the commercial sector:

Preferred Sub-alternative 2a. 20 inches fork length

7. **Establish a commercial trip limit for the Other Jacks Complex**

   Currently: There is no commercial trip limit for the Other Jack Complex (lesser amberjack, almaco jack, and banded rudderfish).

   Preferred Alternative 2. Establish a commercial trip limit for the Other Jacks Complex.
   - **Preferred Sub-alternative 2a.** 500 pounds gutted weight.

8. **Modify the seasonal prohibition on commercial harvest and possession of red grouper in the Exclusive Economic Zone off South Carolina and North Carolina**

   Currently: During January through April, no person may sell or purchase a red grouper harvested from or possessed in the South Atlantic exclusive economic zone.

   Preferred Alternative 2. Maintain the annual January 1 to April 30 prohibition on sale and purchase of shallow-water groupers harvested in the South Atlantic exclusive economic zone, except for red grouper. Prohibit sale and purchase of red grouper harvested from the exclusive economic zone off North Carolina and South Carolina from:
   - **Preferred Sub-alternative 2a.** January – May (five months)

9. **Remove the commercial minimum size limit for certain deep-water species**

   Currently: The commercial minimum size limit for queen snapper, silk snapper, and blackfin snapper in the South Atlantic exclusive economic zone is 12 inches total length.

   Preferred Alternative 2. Remove the 12-inch total length commercial minimum size limit for queen snapper, silk snapper, and blackfin snapper in the South Atlantic exclusive economic zone.

10. **Reduce the commercial minimum size limit for gray triggerfish in the Exclusive Economic Zone off East Florida**

    Currently: The commercial minimum size limit for gray triggerfish in the exclusive economic zone off east Florida is 14 inches fork length.

    Preferred Alternative 2. Reduce the commercial minimum size limit for gray triggerfish in the exclusive economic zone off the east coast of Florida to 12 inches fork length.

Purpose for Actions

The purpose of this amendment is to address commercial stakeholder input to enable equitable access for fishermen participating in the snapper grouper fishery, and to minimize discards.

Need for Actions

The need for this amendment is to improve management of the commercial sector of the snapper grouper fishery to achieve optimum yield, while minimizing, to the extent practicable, adverse socio-economic effects for commercial fishermen in the South Atlantic Region.

Chapter 1. Introduction

1.1 What actions are being proposed in this amendment?

Vision Blueprint Commercial Regulatory Amendment 27 (Regulatory Amendment 27) to the Snapper Grouper Fishery Management Plan (FMP) proposes to modify commercial regulations for species in the snapper grouper fishery, including modifying fishing seasons and seasonal closures, trip limits, and minimum size limits.

> ***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 amendment?

The South Atlantic Fishery Management Council (South Atlantic Council) develops the amendment and submits it to the National Marine Fisheries Service (NMFS) which, on behalf of the Secretary of Commerce, ultimately approves, disapproves, or partially approves the amendment. NMFS also implements the actions in the amendment through the development of regulations through rulemaking. NMFS is an office of the National Oceanic and Atmospheric Administration (NOAA). The South Atlantic Council and NMFS are also responsible for making this document available for public comment. The draft environmental assessment (EA) will be made available to the public during the scoping process, public hearings, and in South Atlantic Council meeting briefing books. The final EA/amendment will be published for public comment during the proposed rule stages of the rulemaking process. The public hearing draft and final EA/amendment may be found online at: http://sero.nmfs.noaa.gov/sustainable_fisheries/s_atl/sg/XXX/index.html and on the South Atlantic Council website at http://www.safmc.net.

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 is conducted under the Snapper Grouper FMP (SAFMC 1983) (**Figure 1.3.1**). There are fifty-five species managed by the South Atlantic Council under the Snapper Grouper FMP.

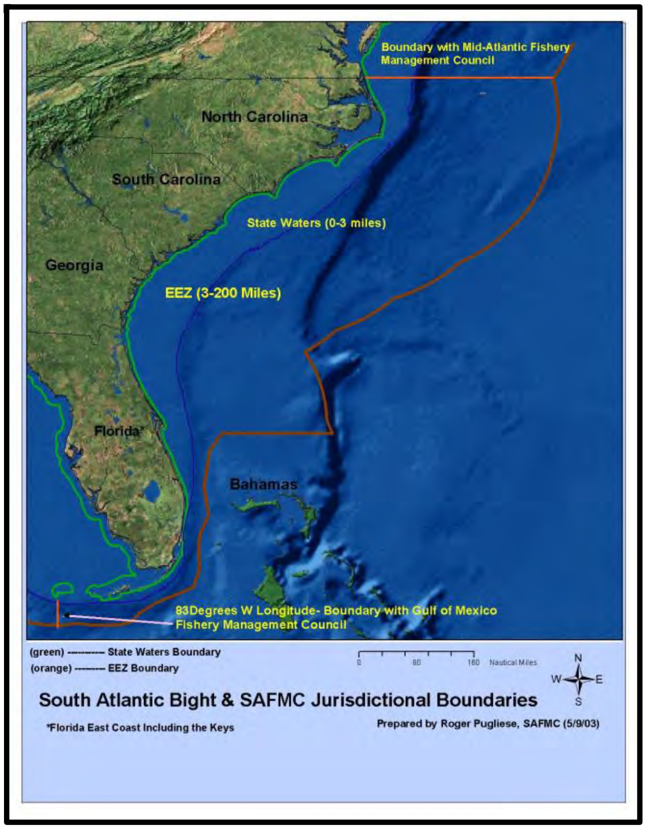

Figure 1.3.1. Jurisdictional boundaries of the South Atlantic Council.

1.4 Purpose and need statement

Purpose for Actions

The purpose of this amendment is to address commercial stakeholder input to enable equitable access for fishermen participating in the snapper grouper fishery, and to minimize discards.

Need for Actions

The need for this amendment is to improve management of the commercial sector of the snapper grouper fishery to achieve optimum yield, while minimizing, to the extent practicable, adverse socio-economic effects for commercial fishermen in the South Atlantic Region.

Definitions

Annual Catch Limits (ACL)
The level of annual catch (pounds or numbers) that triggers accountability measures to ensure that overfishing does not occur.

Annual Catch Targets (ACT)
The level of annual catch (pounds or numbers) that is the management target of the fishery, and accounts for management uncertainty in controlling the actual catch at or below the ACL.

Accountability Measures (AM)
Management controls to prevent ACLs, including sector ACLs, from being exceeded, and to correct or mitigate overages of the ACL if they occur.

Allocations
A division of the overall ACL between sectors (e.g., recreational and commercial) to create sector ACLs.

Maximum Sustainable Yield (MSY)
Largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological and environmental conditions.

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.

Minimum Stock Size Threshold (MSST)
A status determination criterion. If current stock size is below MSST, the stock is overfished.

1.5 What is the history of management for snapper grouper species?

Snapper grouper regulations in the South Atlantic were first implemented in 1983. Refer to **Appendix C** for the management history of the snapper grouper fishery.

Chapter 2. Proposed Actions and Alternatives

2.1 Action 1. Establish a commercial split season and modify the commercial trip limit for blueline tilefish

Alternative 1 (No Action). The commercial fishing year for blueline tilefish in the South Atlantic exclusive economic zone is from January 1 to December 31. The commercial trip limit is 300 pounds gutted weight.

Alternative 2. Specify two commercial fishing seasons for blueline tilefish. Allocate the blueline tilefish commercial annual catch limit into two quotas: 40% to the period January 1 through June 30, and 60% to the period July 1 through December 31. Any remaining quota from Season 1 would transfer to Season 2. Any remaining quota from Season 2 would not be carried forward.

> **Sub-alternative 2a**. Season 1 trip limit equals 100 pounds gutted weight, Season 2 trip limit equals 300 pounds gutted weight.
> **Sub-alternative 2b**. Season 1 trip limit equals 150 pounds gutted weight, Season 2 trip limit equals 300 pounds gutted weight.

Preferred Alternative 3. Retain the January 1 through December 31 commercial fishing year for blueline tilefish in the South Atlantic exclusive economic zone. Modify the commercial trip limit for blueline tilefish:

> **Preferred Sub-alternative 3a.** 100 pounds gutted weight from January 1 through April 30 and 300 pounds gutted weight from May 1 through December 31.
> **Sub-alternative 3b.** 150 pounds gutted weight from January 1 through April 30 and 300 pounds gutted weight from May 1 through December 31.
> **Sub-alternative 3c.** 100 pounds gutted weight from January 1 through June 30 and 300 pounds gutted weight from July 1 through December 31.

Comparison of Alternatives:

2.2 Action 2. Establish a commercial split season for snowy grouper

Alternative 1 (No Action). The commercial fishing year for snowy grouper in the South Atlantic exclusive economic zone is from January 1 to December 31.

Alternative 2. Specify two commercial fishing seasons for snowy grouper. Allocate the snowy grouper commercial annual catch limit into two quotas: 60% to the period January 1 through June 30, and 40% to the period July 1 through December 31. Any remaining quota from Season 1 would transfer to Season 2. Any remaining quota from Season 2 would not be carried forward.

Preferred Alternative 3. Specify two commercial fishing seasons for snowy grouper. Allocate the snowy grouper commercial annual catch limit into two quotas: 70% to the period January 1 through June 30, and 30% to the period July 1 through December 31. Any remaining quota from Season 1 would transfer to Season 2. Any remaining quota from Season 2 would not be carried forward.

Comparison of Alternatives:

Move to Chapter 1 or Summary?

A commercial split season for snowy grouper was considered in Regulatory Amendment 20 (SAFMC 2014). By dividing the commercial ACL into two quotas, it was thought fishermen in the northern and southern areas of the South Atlantic would have a chance to fish for snowy grouper when weather conditions were favorable in their respective areas. The snowy grouper ACL was also increased through the same amendment, and analyses indicated that a commercial harvest closure during Season 1 was not likely. Without an in-season closure during Season 1 for most of the scenarios examined, the South Atlantic Council reasoned that a split season would have little to no effect on extending the fishing season and opted to take no action at that time. In addition, the South Atlantic Council opted to retain the commercial fishing year as the calendar year because snowy grouper are an important species in the early part of the year, when shallow-water groupers are closed to commercial harvest. The South Atlantic Council acknowledged that fishermen in North Carolina have historically had limited access to snowy grouper at the beginning of the fishing year due to weather conditions. However, recent years have brought milder winters and fishermen have benefitted from having access to snowy grouper. South Atlantic Council members also mentioned that snowy grouper commands a higher price on the market during the early months of the year and cited that as another reason to retain the calendar year for the commercial sector.

2.3 Action 3. Establish a commercial split season and modify commercial trip limit for greater amberjack

Council to approve highlighted changes in June

Alternative 1 (No Action). The commercial fishing year for greater amberjack in the South Atlantic exclusive economic zone is from March 1 to the end of February. During April each year, no person may sell or purchase greater amberjack harvested from the South Atlantic exclusive economic zone, and the harvest and possession limit is one per person per day or one per person per trip, whichever is more restrictive. The commercial trip limit in March and from May through the end of February each fishing year is 1,200 pounds whole weight.

Preferred Alternative 2. Specify two commercial fishing seasons for greater amberjack. Allocate the commercial annual catch limit for greater amberjack into two quotas: 50% to the period March 1 through August 31 and 50% to the period September 1 through the end of February. Any remaining quota from Season 1 would transfer to Season 2. Any remaining quota from Season 2 would not be carried forward. During April each year, no person may sell or purchase a greater amberjack harvested from the South Atlantic exclusive economic zone and the harvest and possession limit is one per person per day or one per person per trip, whichever is more restrictive.

> **Sub-alternative 2a.** Season 1 trip limit equals 1,200 pounds whole weight, Season 2 trip limit equals 1,000 pounds whole weight.
> **Sub-alternative 2b.** Season 1 trip limit equals 1,000 pounds whole weight, Season 2 trip limit equals 800 pounds whole weight.
> **Preferred Sub-alternative 2c.** Trip limit equals 1,000 pounds whole weight in both seasons.
> **Sub-alternative 2d.** Trip limit equals 1,000 pounds whole weight in both seasons. A trip limit reduction to 500 pounds whole weight would occur in each season once 75% of the seasonal quota is met or projected to be met. A trip limit reduction would not occur in Season 2 unless 75% of the Season 2 quota is met or is projected to be met by January 31.

Alternative 3. Specify two commercial fishing seasons for greater amberjack. Allocate the commercial annual catch limit for greater amberjack into two quotas: 60% to the period March 1 through August 31 and 40% to the period September 1 through the end of February. Any remaining quota from Season 1 would transfer to Season 2. Any remaining quota from Season 2 would not be carried forward. During April each year, no person may sell or purchase a greater amberjack harvested from the South Atlantic exclusive economic zone and the harvest and possession limit is one per person per day or one per person per trip, whichever is more restrictive.

> **Sub-alternative 3a.** Season 1 trip limit equals 1,200 pounds whole weight, Season 2 trip limit equals 1,000 pounds whole weight.
> **Sub-alternative 3b.** Season 1 trip limit equals 1,000 pounds whole weight, Season 2 trip limit equals 800 pounds whole weight.
> **Sub-alternative 3c.** Trip limit equals 1,000 pounds whole weight in both seasons.

Alternative 4. Retain the March through February fishing year ~~Reduce the greater amberjack commercial trip limit~~. During April each year, no person may sell or purchase a greater amberjack harvested from the South Atlantic exclusive economic zone and the harvest and possession limit is one per person per day or one per person per trip, whichever is more restrictive. Reduce the greater amberjack commercial trip limit to:

Sub-alternative 4a. 1,000 pounds whole weight.

Sub-alternative 4b. 800 pounds whole weight.

Comparison of Alternatives:

2.4 Action 4. Establish a commercial split season and modify the commercial trip limit for red porgy

Council to approve highlighted changes in June

Alternative 1 (No Action). The commercial fishing year for red porgy in the South Atlantic exclusive economic zone is from January 1 to December 31. During January 1 through April 30 each year, no person may sell or purchase red porgy harvested from the South Atlantic exclusive economic zone, and the harvest and possession limit is three per person per day or three per person per trip, whichever is more restrictive. From May 1 through December 31 each year, the commercial trip limit for red porgy is 120 fish.

Preferred Alternative 2. Specify two commercial fishing seasons for red porgy. Allocate the commercial red porgy annual catch limit into two quotas: 30% to the period January 1 through April 30 and 70% to the period May 1 through December 31. Any remaining quota from Season 1 would transfer to Season 2. Any remaining quota from Season 2 would not be carried forward. Remove the sale and purchase prohibition and the possession limit of three per person per day or three per person per trip, whichever is more restrictive, during January 1 to April 30 each year. Retain the commercial trip limit of 120 fish from May 1 through December 31 and specify a commercial trip limit from January 1 through April 30 of:

Sub-alternative 2a. 30 fish.
Sub-alternative 2b. 45 fish.
Preferred Sub-alternative 2c. 60 fish.

Alternative 3. Specify two commercial fishing seasons for red porgy. Allocate the commercial red porgy ACL into two quotas: 50% to the period January 1 through April 30 and 50% to the period May 1 through December 31. Any remaining quota from Season 1 would transfer to Season 2. Any remaining quota from Season 2 would not be carried forward. Remove the sale and purchase prohibition during January 1 to April 30 each year and the possession limit of three per person per day or three per person per trip, whichever is more restrictive. Retain the commercial trip limit of 120 fish from May 1 through December 31 and specify a commercial trip limit from January 1 through April 30 of:

Sub-alternative 3a. 30 fish.
Sub-alternative 3b. 45 fish.
Sub-alternative 3c. 60 fish.

Alternative 4. Remove the sale and purchase prohibition and the possession limit of three per person per day or three per person per trip, whichever is more restrictive, ~~and harvest and possession restrictions~~ for red porgy from the South Atlantic exclusive economic zone during January 1 to April 30 each year. Specify a commercial trip limit of 120 fish from January 1 through December 31.

Comparison of Alternatives:

2.5 Action 5. Modify the commercial trip limit for vermilion snapper

Council to approve highlighted changes in June

Alternative 1 (No Action). The commercial fishing year for vermilion snapper in the South Atlantic exclusive economic zone is from January 1 to December 31. The commercial annual catch limit is split into two quotas: 50% to the period January 1 through June 30 and 50% to the period July 1 through December 31. Any remaining quota from Season 1 transfers to Season 2. Any remaining quota from Season 2 is not carried forward. The commercial trip limit for vermilion snapper in the South Atlantic exclusive economic zone is 1,000 pounds gutted weight. For both seasons, when 75% of the vermilion snapper seasonal quota is met or is projected to be met, the trip limit is reduced to 500 pounds gutted weight.

Alternative 2. Retain the commercial trip limit and trip limit reduction in Season 1 (January 1 through June 30). For Season 2 (July 1 through December 31), modify the commercial trip limit to 750 pounds gutted weight and remove the trip limit reduction. Any remaining quota from Season 1 transfers to Season 2. Any remaining quota from Season 2 is not carried forward.

Alternative 3. Retain the commercial trip limit and trip limit reduction in Season 1 (January 1 through June 30). For Season 2 (July 1 through December 31), modify the commercial trip limit to 500 pounds gutted weight and remove the trip limit reduction. Any remaining quota from Season 1 transfers to Season 2. Any remaining quota from Season 2 is not carried forward.

Alternative 4. Modify the commercial trip limit for both seasons and remove trip limit reductions:

Sub-alternative 4a. 1,000 pounds gutted weight
Sub-alternative 4b. 850 pounds gutted weight
Sub-alternative 4c. 700 pounds gutted weight

Comparison of Alternatives:

2.6 Action 6. Establish a minimum size limit for almaco jack for the commercial sector

Council to approve highlighted changes in June

Alternative 1 (No Action). There is no commercial minimum size limit specified for almaco jack.

Preferred Alternative 2. Establish a minimum size limit for almaco jack for the commercial sector:

Preferred Sub-alternative 2a. 20 inches fork length.
Sub-alternative 2b. 22 inches fork length.
Sub-alternative 2c. 24 inches fork length.
Sub-alternative 2d. 26 inches fork length.

Comparison of Alternatives

2.7 Action 7. Establish a commercial trip limit for the Other Jacks Complex

Council to approve highlighted changes in June

Alternative 1 (No Action). There is no commercial trip limit for the Other Jacks Complex (lesser amberjack, almaco jack, and banded rudderfish).

Preferred Alternative 2. Establish a commercial trip limit for the Other Jacks Complex:

- **Preferred Sub-alternative 2a.** 500 pounds gutted weight.
- **Sub-alternative 2b.** 400 pounds gutted weight.
- **Sub-alternative 2c.** 300 pounds gutted weight.

Comparison of Alternatives

Action 8. Modify the seasonal prohibition on commercial harvest and possession and sale and purchase of red grouper in the Exclusive Economic Zone off South Carolina and North Carolina

Council to approve highlighted changes in June

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

Preferred Alternative 2. Maintain seasonal prohibition on sale and purchase of shallow-water groupers annually from January 1 to April 30 in the South Atlantic exclusive economic zone. Prohibit sale and purchase of red grouper in the exclusive economic zone off North Carolina and South Carolina from:

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

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

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

Comparison of Alternatives

2.9 Action 9. Remove the commercial minimum size limits for certain deep-water species

Alternative 1 (No Action). The commercial minimum size limit for queen snapper, silk snapper, and blackfin snapper in the South Atlantic exclusive economic zone is 12 inches total length.

Preferred Alternative 2. Remove the 12-inch total length commercial minimum size limit for queen snapper, silk snapper, and blackfin snapper in the South Atlantic exclusive economic zone.

Comparison of Alternatives

2.10 Action 10. Reduce the commercial minimum size limit for gray triggerfish in the Exclusive Economic Zone off east Florida

Alternative 1 (No Action). The commercial minimum size limit for gray triggerfish in the exclusive economic zone off the east coast of Florida is 14 inches fork length.

Preferred Alternative 2. Reduce the commercial minimum size limit for gray triggerfish in the exclusive economic zone off the east coast of Florida to 12 inches fork length.

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[1] (FEP; SAFMC 2009b) and incorporated here by reference.

3.1.2 Offshore Habitat

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

[1] The FEP can be found at: http://safmc.net/ecosystem-management/fishery-ecosystem-plan/.

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 (FWRI), 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 Council's online map services provided by the newly developed SAFMC Habitat and Ecosystem Atlas[2]

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

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;

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

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

The potential impacts the actions in this 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.

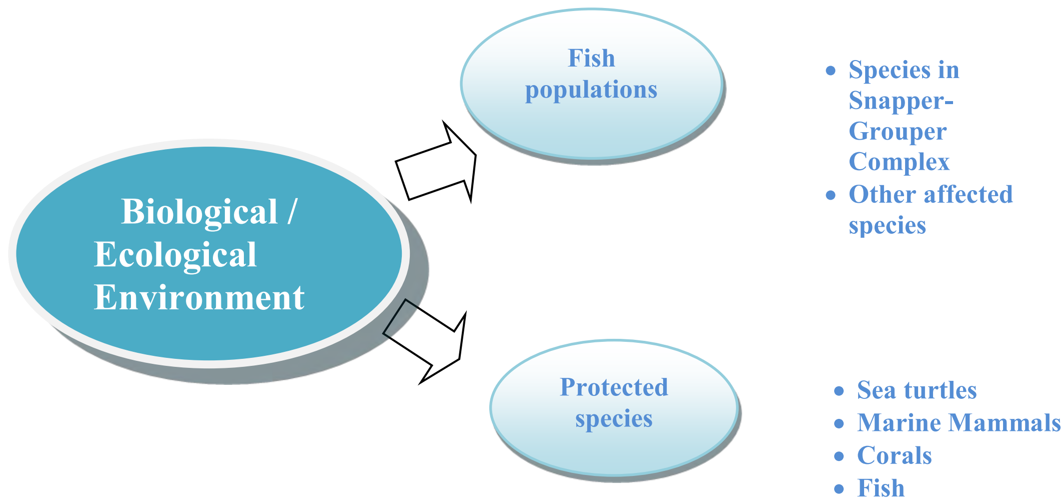

Figure 3.2.1. Two components of the biological environment described in this document.

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

Life history information for snapper grouper species affected by this amendment may be found in the South Atlantic EcoSpecies Database[3]. In addition, timing of spawning for several snapper grouper species in the South Atlantic region is summarized in **Table 3.2.1**.

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

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

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

doi:10.1371/journal.pone.0172968.t006

Source: Farmer et al. 2017 and references therein.

3.2.2 Bycatch

Will update based on recently completed BPA

As summarized in **Appendix D**, the Bycatch Practicability Analysis (BPA), the actions in Regulatory Amendment 27 are not expected to increase bycatch. In addition, the South Atlantic Council, the National Marine Fisheries Service (NMFS), and the Southeast Fisheries Science Center (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. See **Appendix D** for detailed descriptions of bycatch when fishing for species found in the Snapper Grouper Complex.

3.2.3 Other Species Affected

Vision Blueprint Regulatory Amendment 27 affects several species in the Snapper Grouper Complex (blueline tilefish, snowy grouper, greater amberjack, red porgy, vermilion snapper, Other Jacks Complex, red grouper, silk snapper, black fin snapper, queen snapper, and gray triggerfish). For life history information of the remainder of species in the Fishery Managemet Unit that are not directly affected by actions in this amendment, refer to the South Atlantic Ecospecies Database (see reference above).

3.2.4 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 the National Marine Fisheries Service (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 South Atlantic Council's Scientific and Statistical Committee (SSC). The SSC considers whether the assessment represents the best available science and develops fishing level recommendations for South Atlantic 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.

3.2.5 Protected Species

NMFS manages marine protected species in the Southeast region under the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA). There are 29 ESA-listed species or Distinct Population Segments (DPSs) of marine mammals, sea turtles, fish, and corals managed by NMFS that may occur in the EEZ of the South Atlantic or Gulf of Mexico. There are 91 stocks of marine mammals managed within the Southeast region plus the addition of the stocks such as NARWs, and humpback, sei, fin, minke, and blue whales that regularly or sometimes occur in Southeast region managed waters for a portion of the year (Hayes et al. 2017). All marine mammals in U.S. waters are protected under the MMPA. The MMPA requires that each commercial fishery be classified by the number of marine mammals they seriously injure or kill. NMFS's List of Fisheries (LOF) classifies U.S. commercial fisheries into three categories based on the number of incidental mortality or serious injury they cause to marine mammals. More information about the LOF and the classification process can be found at: http://www.nmfs.noaa.gov/pr/interactions/fisheries/2016_list_of_fisheries_lof.html.

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 South Atlantic Council's jurisdiction.

NMFS has conducted several Section 7 consultations under the ESA to evaluate the potential effects from the South Atlantic snapper grouper fishery on ESA-listed species and their designated critical habitat. 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. Summary information on the species that may be adversely affected by the snapper grouper fishery and how they are affected is presented below. The 2016 Opinion provides additional information on these species, how they are affected by the snapper grouper fishery, and the authorized incidental take levels of these species in the snapper grouper fishery (NMFS 2016).

3.2.5.1 North Atlantic Right Whales (NARW)

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

The coastal waters of the southeastern U.S. are a wintering and the sole known calving area for NARW. NARW generally occur off South and North Carolina from November 1 through April 30 and have been sighted as far as about 30 nautical miles (nmi) offshore (Knowlton et al. 2002; Pabst et al. 2009). Sighting records of NARW spotted in the core calving area off Georgia and Florida consist of mostly mother-calf pairs and juveniles but also some adult males and females without calves (Cole et al. 2013; Kraus and Rolland 2007; Parks et al. 2007). The NARW minimum stock size is based on a census of individual whales identified using photoidentification techniques. A review of the photo-ID recapture database as it existed on 17 November 2015 indicated that 440 individually recognized whales in the catalog were known to be alive during 2012. This number represents a minimum population size. This is a direct count and has no associated coefficient of variation (Hayes et al. 2017). Since June 7, 2017, elevated NARW mortalities began in 2017, primarily in Canada and were declared an Unusual Mortality Event (UME). In 2017 a total of 17 confirmed dead stranded whales (12 in Canada; 5 in the U.S.), and five live whale entanglements in Canada have been documented. To date in 2018, one whale stranded in the U.S. bringing the total mortalities to 18 confirmed dead stranded whales (12 in Canada; 6 in the U.S.). More information on this UME is provided at: https://www.fisheries.noaa.gov/national/marine-life-distress/2017-2018-north-atlantic-right-whale-unusual-mortality-event

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

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

3.2.5.2 ESA-Listed Sea Turtles

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

Green sea turtle hatchlings are thought to occupy pelagic areas of the open ocean and are often associated with *Sargassum* rafts (Carr 1987, Walker 1994). Pelagic stage green sea turtles are thought to be carnivorous. Stomach samples of these animals found ctenophores and pelagic snails (Frick 1976, Hughes 1974). At approximately 20 to 25 cm carapace length, juveniles migrate from pelagic habitats to benthic foraging areas (Bjorndal 1997). As juveniles move into benthic foraging areas a diet shift towards herbivory occurs. They consume primarily seagrasses and algae, but are also know to consume jellyfish, salps, and sponges (Bjorndal 1980, 1997; Paredes 1969; Mortimer 1981, 1982). The diving abilities of all sea turtles species vary by their life stages. The maximum diving range of green sea turtles is estimated at 110 m (360 ft) (Frick 1976), but they are most frequently making dives of less than 20 m (65 ft.) (Walker 1994). The time of these dives also varies by life stage. The maximum dive length is estimated at 66 minutes with most dives lasting from 9 to 23 minutes (Walker 1994). On April 6, 2016, NMFS and the U.S. Fish and Wildlife Service published a Final Rule in the Federal Register (81 FR 20057) removing the range-wide and breeding population ESA listings of the green sea turtle, and in their place, listing 8 green sea turtle DPSs as threatened and 3 green sea turtle DPSs as endangered, effective May 6, 2016. Two of the green sea turtle DPSs, the North Atlantic DPS and the South Atlantic DPS, occur in the South Atlantic Region.

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

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

Leatherbacks are the most pelagic of all ESA-listed sea turtles and spend most of their time in the open ocean. Although they will enter coastal waters and are seen over the continental shelf on a seasonal basis to feed in areas where jellyfish are concentrated. Leatherbacks feed primarily on cnidarians (medusae, siphonophores) and tunicates. Unlike other sea turtles, leatherbacks' diets do not shift during their life cycles. Because leatherbacks' ability to capture and eat jellyfish is not constrained by size or age, they continue to feed on these species regardless of life stage (Bjorndal 1997). Leatherbacks are the deepest diving of all sea turtles. It is estimated that these species can dive in excess of 1,000 m (Eckert et al. 1989) but more frequently dive to depths of 50 m to 84 m (Eckert et al. 1986). Dive times range from a maximum of 37 minutes to more routines dives of 4 to 14.5 minutes (Standora et al. 1984, Eckert et al. 1986, Eckert et al. 1989, Keinath and Musick 1993). Leatherbacks may spend 74% to 91% of their time submerged (Standora et al. 1984).

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

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

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

Regulations implemented through Amendment 15B to the Snapper Grouper FMP (74 FR 31225; June 30, 2009; SAFMC 2008b) required all commercial or charter/headboat vessels with a South Atlantic snapper grouper permit, carrying hook-and-line gear on board, to possess required literature and release gear to aid in the safe release of incidentally caught sea turtles.These regulations are thought to decrease the mortality associated with accidental interactions with sea turtles.

3.2.5.3 ESA-Listed Marine Fish

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

On June 29, 2016, NMFS published a final rule in the *Federal Register* listing **Nassau grouper** as threatened under the ESA due to a decline in its population (81 FR 42268). The final rule became effective on July 29, 2016. The Nassau grouper's confirmed distribution currently includes “Bermuda and Florida (USA), throughout the Bahamas and Caribbean Sea” (e.g., Heemstra and Randall 1993, Hill and Sadovy de Mitcheson, 2013). The Nassau grouper is primarily a shallow-water, insular fish species that has long been valued as a major fishery resource throughout the wider Caribbean, South Florida, Bermuda, and the Bahamas (Carter et al. 1994). As larvae, Nassau grouper are planktonic. After an average of 35-40 days and at an average size of 32 millimeters total length (TL), larvae recruit from an oceanic environment into demersal habitats (Colin 1992, Eggleston 1995). Juvenile Nassau grouper (12-15 centimeters TL) are relatively solitary and remain in specific areas (associated with macroalgae, and both natural and artificial reef structure) for months (Bardach 1958). As juveniles grow, they move progressively to deeper areas and offshore reefs (Tucker et al. 1993, Colin et al. 1997). Smaller juveniles occur in shallower inshore waters (3.7-16.5 meters [m]) and larger juveniles are more common near deeper (18.3-54.9 m) offshore banks (Bardach et al. 1958, Cervigón 1966, Silva Lee 1974, Radakov et al. 1975, Thompson and Munro 1978). Adult Nassau grouper also tend to be relatively sedentary and are commonly associated with high-relief coral reefs or rocky substrate in clear waters to depths of 130 m. Generally, adults are most common at depths less than 100 m (Hill and Sadovy de Mitcheson 2013) except when at spawning aggregations where they are known to descend to depths of 255 m (Starr et al. 2007). Nassau grouper form spawning aggregations at predictable locations around the winter full moons, or between full and new moons (Smith 1971, Colin 1992, Tucker et al. 1993, Aguilar-Perera 1994, Carter et al. 1994, Tucker and Woodward 1994). The most serious threats to the status of Nassau grouper today are fishing at spawning aggregations and inadequate law enforcement protecting spawning aggregations in many foreign nations. There are no known spawning aggregations within the South Atlantic Region.

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

3.3 Economic Environment

Details of the South Atlantic snapper grouper fishery in general, can be found in Snapper Grouper Amendment 17A (SAFMC 2010) and the Comprehensive ACL Amendment for the South Atlantic Region (SAFMC 2011), respectively.

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[4] data set. Inflation adjusted revenues and prices are reported in 2016 dollars. All nominal dollar values were converted to 2016 dollars using the annual GDP implicit price deflator provided by the U.S. Bureau of Economic Analysis.

3.3.1.1 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. 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 2012 through 2016 (**Table 3.3.1.1**).

[4] 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.

Table 3.3.1.1. Number of valid or renewable South Atlantic commercial snapper grouper permits.

	Unlimited	225-lb Trip-limited	Total Permits
2012	604	132	736
2013	592	129	721
2014	584	125	709
2015	571	121	692
2016	565	116	681
Average	583	125	708

Source: NMFS SERO Permits Dataset, 2018.

Dealers that want to purchase, receive, trade, or barter snapper grouper species or species complexes, excluding wreckfish, caught by federal commercially permitted fishing vessels must have a Gulf and South Atlantic dealer permit. As of March 23, 2016, there were 418 dealer permits issued, with over half (57%) residing in Florida (**Table 3.3.1.2**).

Table 3.3.1.2. Number and percentage of Gulf and South Atlantic dealer permits by state of residence of permit holder as of March 23, 2016.

State	Number	Percent
FL	240	57.4%
GA	4	1.0%
NC	56	13.4%
SC	25	6.0%
Subtotal	325	77.8%
All Other	93	22.2%
Total	418	100%

Source: NMFS SERO Permits Dataset, accessed March 23, 2016.

3.3.1.2 Landings, Revenue, and Effort

The following focuses on commercial landings and revenues for the following key species in this amendment: blueline tilefish, red porgy, snowy grouper, greater amberjack, vermillion snapper, the jacks complex (lesser amberjack, almaco jack, banded rudderfish), shallow water groupers (gag grouper, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, graysby, coney), queen snapper, silk snapper, blackfin snapper, and gray triggerfish. Landings data for Georgia were often confidential due to the low number of commercial participants in the snapper grouper fishery originating from this state. As a result, commercial landings from Georgia were combined with those from Florida and are displayed as either Florida/Georgia or FL/GA in many of the following tables and figures examining landings by state.

3.3.1.3 Species

Blueline Tilefish

Blueline tilefish is within the tilefishes group (Malacanthidae) of the snapper grouper fishery, that includes 2 other species. Average monthly commercial landings of blueline tilefish from 2012-2016 are displayed in **Figure 3.3.1.1**. The landings tend to be the highest in the late spring and summer months. Among the South Atlantic states, North Carolina accounted for most of the blueline tilefish landings in most years (**Figure 3.3.1.2**), however South Carolina accounted for a much larger share in 2014 and 2015.

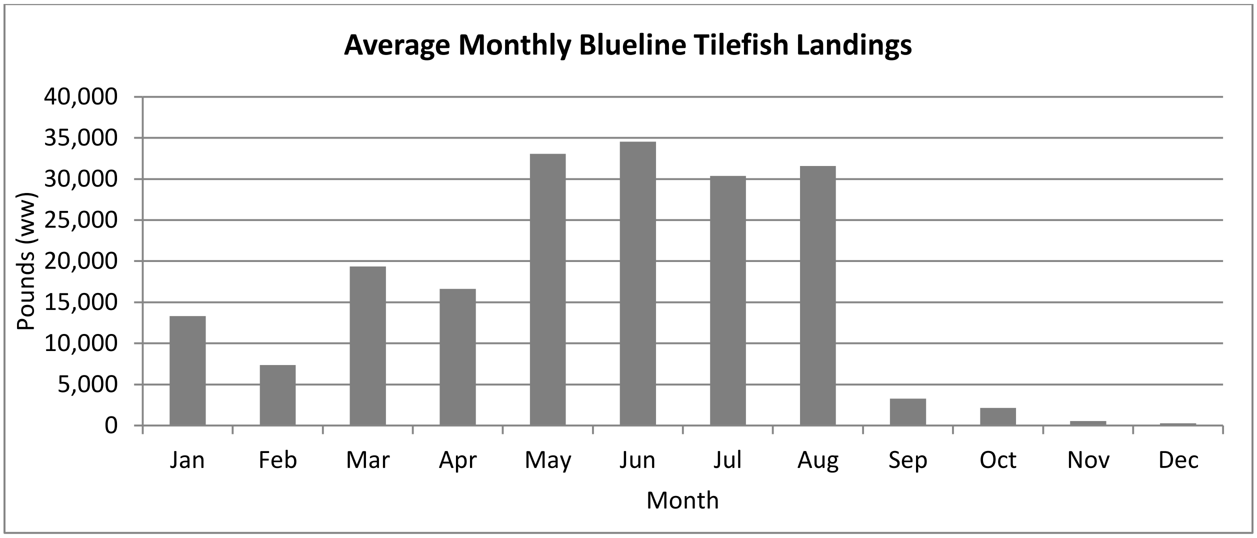

Figure 3.3.1.1. Average monthly commercial landings (lbs ww) of blueline tilefish harvested from the South Atlantic, 2012-2016.
Source: NMFS Commercial ALS Dataset.

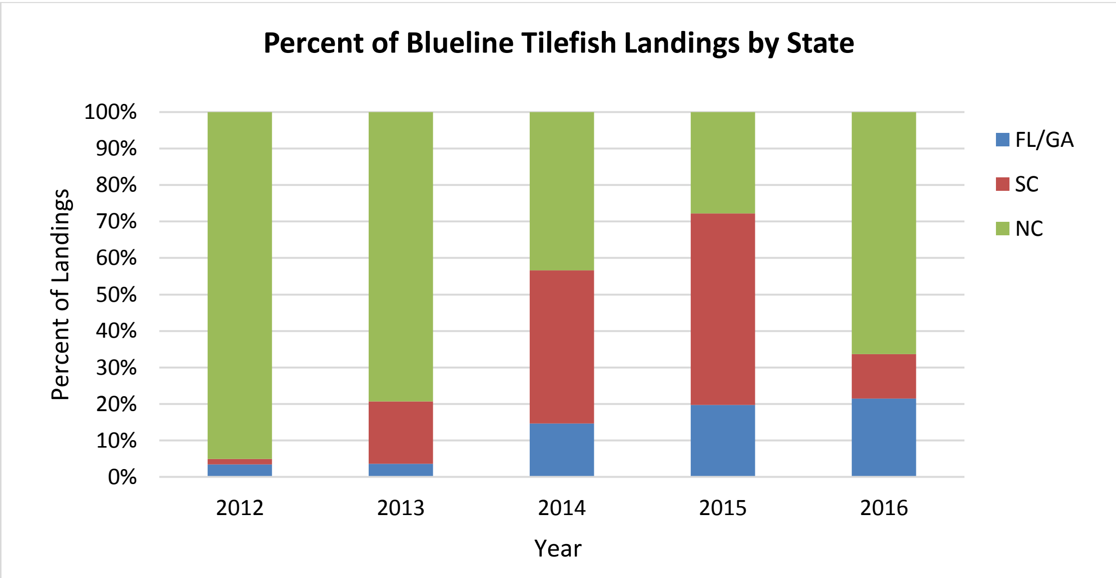

Figure 3.3.1.2. Percent of blueline tilefish landings (lbs gw) by state, 2012-2016.
Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Annual commercial landings of blueline tilefish in the South Atlantic ranged from approximately 89,000 lbs gutted weight (gw) to 297,000 lbs gw and averaged 173,978 lbs gw from 2012 through 2016 (**Figure 3.3.1.3, Table 3.3.1.3**). Dockside revenues from those landings ranged from about $233,000 to $730,000 and averaged $467,774 (2016 dollars) (**Figure 3.3.1.3**, **Table 3.3.1.4**). The average dockside price during those five years was $2.75 per lb gw (2016 dollars) and an annual average of 134 vessels took 591 commercial trips landing blueline tilefish. Average annual dockside revenue from blueline tilefish landings represented approximately 23% of total dockside revenue from trips that landed blueline tilefish from 2012 through 2016.

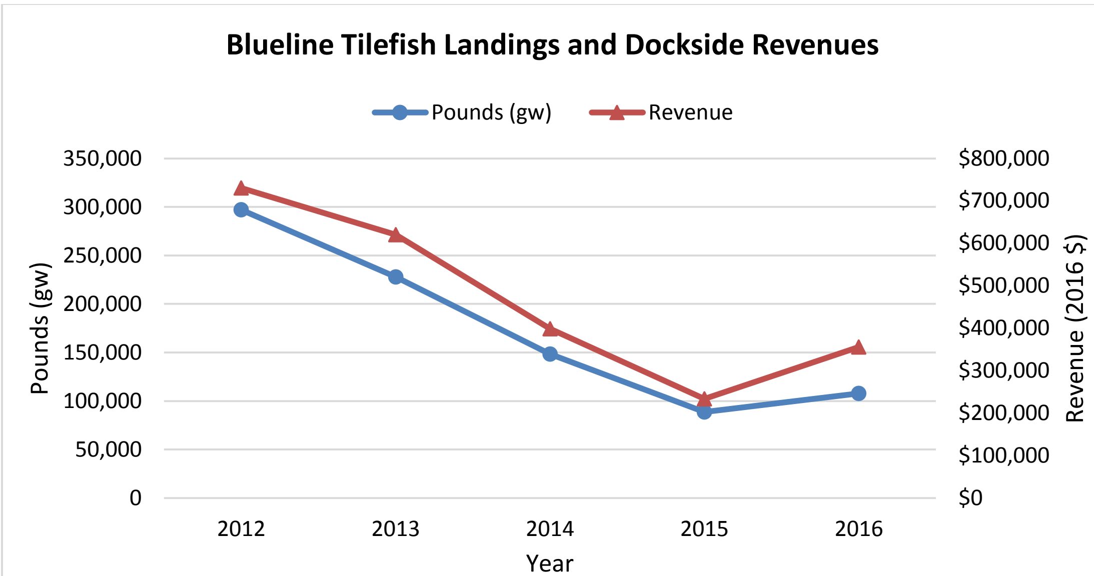

Figure 3.3.1.3. Annual commercial landings of blueline tilefish by weight (lbs gw) and dockside revenue (2016 dollars), 2012–2016.
Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Table 3.3.1.3 Number of vessels, number of trips, and landings by year for vessels that landed blueline tilefish from the South Atlantic, 2012-2016.

Year	Number of vessels that caught blueline tilefish	Number of trips that caught blueline tilefish	Blueline tilefish landings (lbs gw)	Other species' landings jointly caught with blueline tilefish (lbs gw)	Number of SATL trips that only caught other species	Other species' landings on SATL trips without blueline tilefish (lbs gw)
2012	124	536	297,086	386,319	1,489	2,671,637
2013	129	641	227,734	552,690	1,871	2,638,346
2014	137	530	148,461	522,896	1,559	3,591,839
2015	123	355	88,771	289,136	903	2,882,667
2016	155	893	107,881	550,675	1,903	3,436,181
Average	134	591	173,987	460,343	1,545	3,044,134

Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Table 3.3.1.4 Number of vessels and dockside revenues by year for vessels that landed blueline tilefish from the South Atlantic, 2012-2016 (2016 dollars).

Year	Number of vessels that caught blueline tilefish	Dockside revenue from blueline tilefish	Dockside revenue from 'other species' jointly caught with blueline tilefish	Dockside revenue from 'other species' caught on SATL trips without blueline tilefish	Total dockside revenue	Average dockside revenue per vessel
2012	124	$730,221	$1,122,941	$7,389,313	$9,242,475	$74,536
2013	129	$620,582	$1,752,682	$7,810,862	$10,184,126	$78,947
2014	137	$398,789	$1,679,316	$9,781,597	$11,859,702	$86,567
2015	123	$233,292	$1,070,236	$8,137,263	$9,440,791	$76,754
2016	155	$355,988	$2,053,800	$9,116,731	$11,526,519	$74,365
Average	134	$467,774	$1,535,795	$8,447,153	$10,450,723	$78,234

Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Snowy Grouper

Snowy grouper is within the sea basses and groupers (Serranidae) group of the snapper grouper fishery that includes 19 other species. Average monthly commercial landings of snowy grouper from 2012-2016 are displayed in **Figure 3.3.1.4**. The landings tend to be the highest in the late spring and summer months, with peak landings occurring in May. Among the South Atlantic states, Florida/Georgia typically accounts for the majority of commercial snowy grouper landings (**Figure 3.3.1.5**). On average, over half of the commercial snowy grouper landings are landed in this area, although North Carolina has been accounting for a larger portion in recent years.

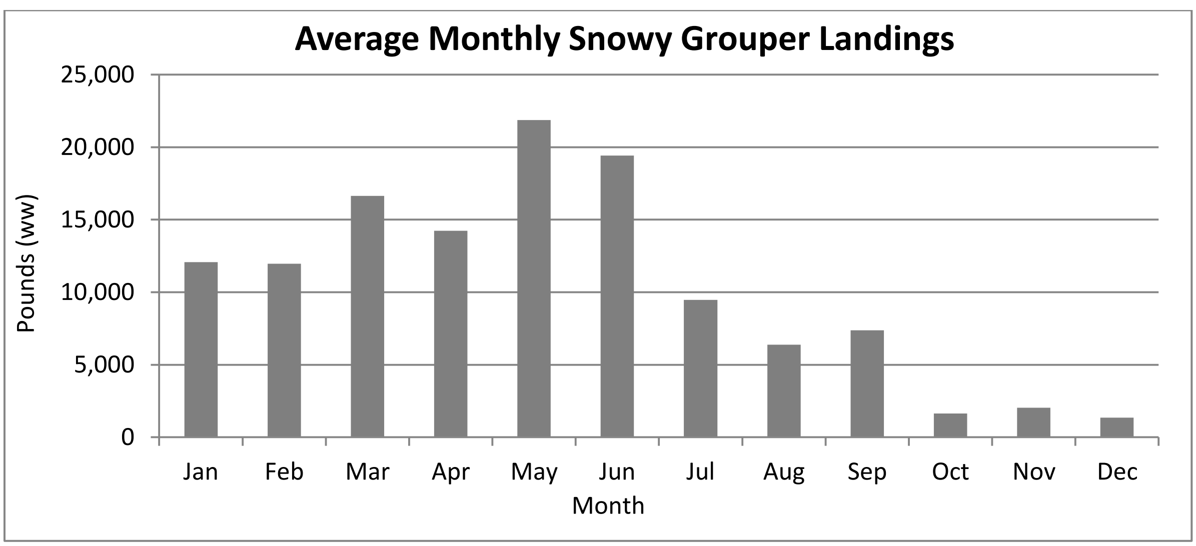

Figure 3.3.1.4. Average monthly commercial landings (lbs ww) of snowy grouper harvested from the South Atlantic, 2012-2016.
Source: NMFS Commercial ALS Dataset.

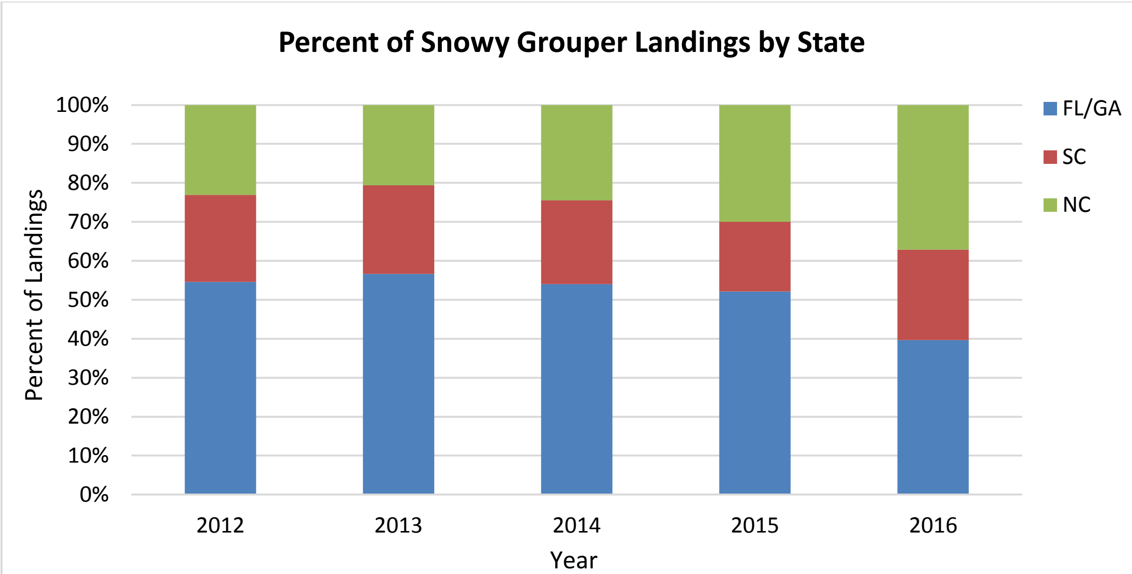

Figure 3.3.1.5. Percent of snowy grouper landings (lbs gw) by state, 2012-2016.
Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Annual commercial landings of snowy grouper in the South Atlantic ranged from approximately 74,000 lbs gw to 142,000 lbs gw and averaged 101,521 lbs gw from 2012 through 2016 (**Figure 3.3.1.6**, **Table 3.3.1.5**). Dockside revenues from those landings ranged from about $343,000 to $726,000 and averaged $488,813 (2016 dollars) (**Figure 3.3.1.7**, **Table 3.3.1.6**). The average dockside price during those five years was $4.76 per lb gw (2016 dollars) and an annual average of 149 vessels took 1,130 commercial trips landing snowy grouper. Average annual dockside revenue from snowy grouper landings represented approximately 14% of total dockside revenue from trips that landed snowy grouper from 2012 through 2016.

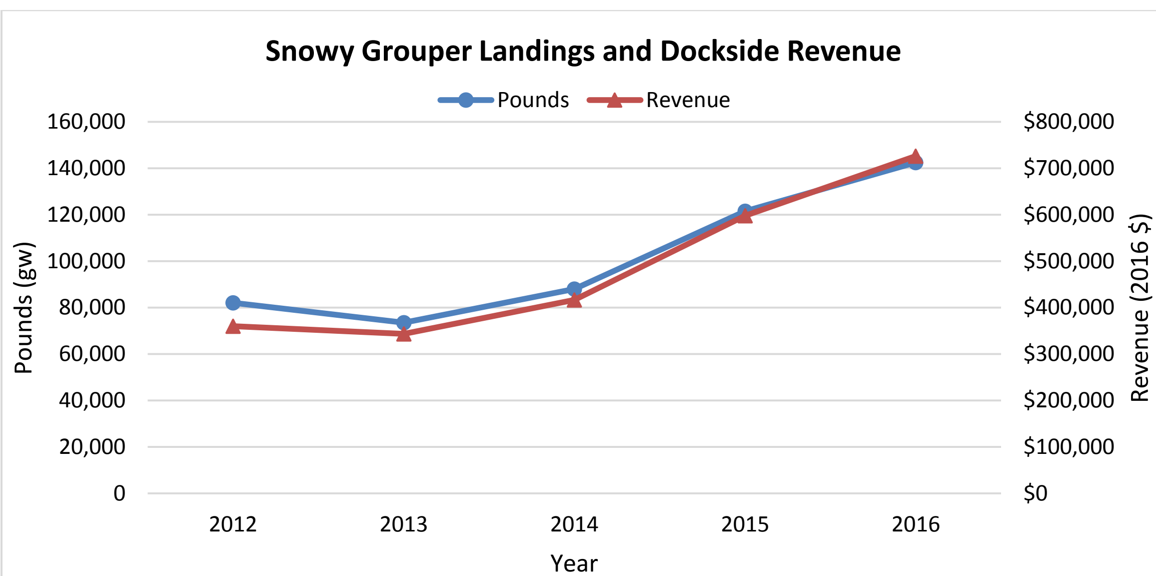

Figure 3.3.1.6. Annual commercial landings of snowy grouper by weight (lbs gw) and dockside revenue (2016 dollars), 2012-2016.
Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Table 3.3.1.5 Number of vessels, number of trips, and landings by year for vessels that landed snowy grouper from the South Atlantic, 2012-2016.

Year	Number of vessels that caught snowy grouper	Number of trips that caught snowy grouper	Snowy grouper landings (lbs gw)	Other species' landings jointly caught with snowy grouper (lbs gw)	Number of SATL trips that only caught other species	Other species' landings on SATL trips without snowy grouper (lbs gw)
2012	129	1,100	82,078	839,557	3,374	2,874,220
2013	133	970	73,573	842,923	3,524	2,837,590
2014	151	1,094	87,989	1,000,489	4,579	3,974,200
2015	170	1,355	121,514	978,059	4,581	3,361,951
2016	162	1,133	142,452	790,753	4,602	3,239,535
Average	149	1,130	101,521	890,356	4,132	3,257,499

Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Table 3.3.1.6. Number of vessels and dockside revenues by year for vessels that landed snowy grouper from the South Atlantic, 2012-2016 (2016 dollars).

Year	Number of vessels that caught snowy grouper	Dockside revenue from snowy grouper	Dockside revenue from 'other species' jointly caught with snowy grouper	Dockside revenue from 'other species' caught on SATL trips without snowy grouper	Total dockside revenue	Average total dockside revenue per vessel
2012	129	$359,987	$2,432,990	$7,384,070	$10,177,047	$78,892
2013	133	$343,189	$2,577,916	$7,967,236	$10,888,341	$81,867
2014	151	$416,721	$3,167,771	$10,298,675	$13,883,167	$91,942
2015	170	$598,232	$3,287,565	$8,638,071	$12,523,868	$73,670
2016	162	$725,936	$2,897,108	$8,421,147	$12,044,191	$74,347
Average	149	$488,813	$2,872,670	$8,541,840	$11,903,323	$80,143

Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Greater Amberjack

Greater amberjack is within the jacks group (Carangidae) of the snapper grouper fishery that includes 3 other species. Average monthly commercial landings of greater amberjack from 2012-2016 are displayed in **Figure 3.3.1.7**. The landings tend to be the highest in the spring months, with peak landings occurring in May, directly after the annual April commercial harvest closure for the spawning season. Among the South Atlantic states, Florida/Georgia accounts for most commercial greater amberjack landings (**Figure 3.3.1.8**). On average, this area accounts for approximately 80% of commercial greater amberjack landings annually.

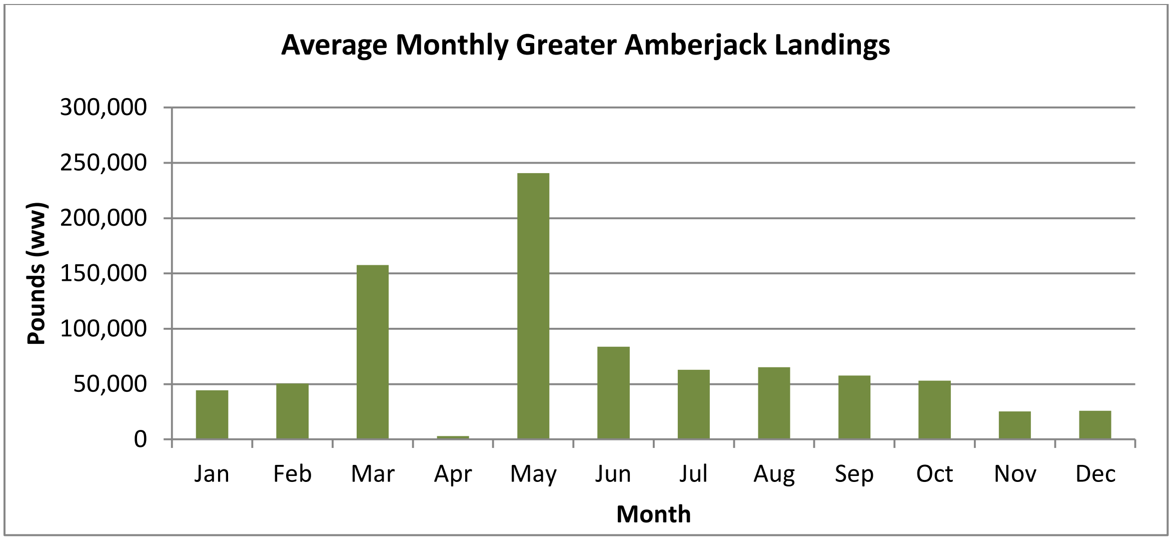

Figure 3.3.1.7. Average monthly commercial landings (lbs ww) of greater amberjack harvested from the South Atlantic, 2012-2016.
Source: NMFS Commercial ALS Dataset

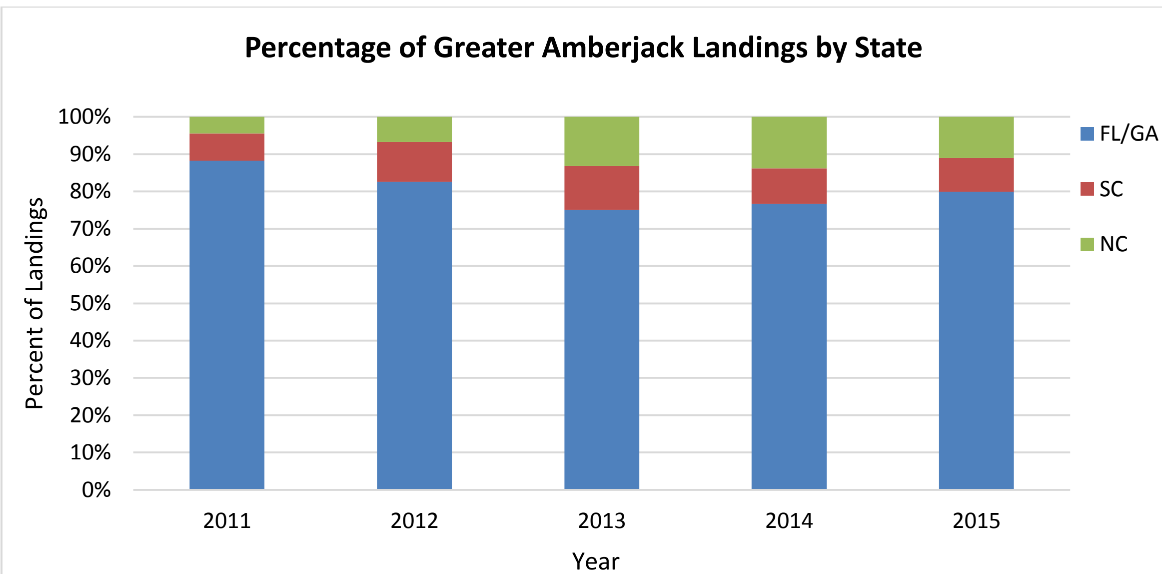

Figure 3.3.1.8. Percent of greater amberjack landings (lbs gw) by state, 2012-2016.
Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Annual commercial landings of greater amberjack in the South Atlantic ranged from approximately 757,000 lbs gw to 929,000 lbs gw and averaged 850,144 lbs gw from 2012 through 2016 (**Figure 3.3.1.9**, **Table 3.3.1.7**). Dockside revenues from those landings ranged from about $1,121,000 to $1,376,000 and averaged $1,238,975 (2016 dollars) (**Figure 3.3.1.9**, **Table 3.3.1.8**). The average dockside price during those five years was $1.47 per lb gw (2016 dollars) and an annual average of 263 vessels took 2,185 commercial trips landing greater amberjack. Average annual dockside revenue from greater amberjack landings represented approximately 23% of total dockside revenue from trips that landed greater amberjack from 2012 through 2016.

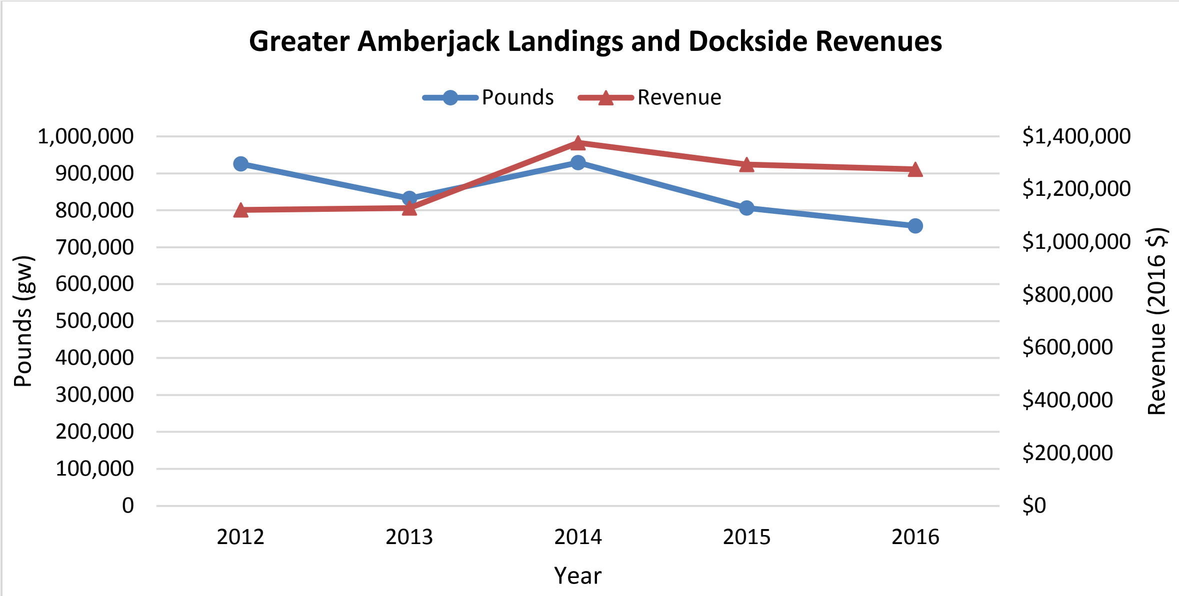

Figure 3.3.1.9. Annual commercial landings of greater amberjack by weight (lbs gw) and dockside revenue (2016 dollars), 2012-2016.
Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Table 3.3.1.7 Number of vessels, number of trips, and landings by year for vessels that landed greater amberjack from the South Atlantic, 2012-2016.

Year	Number of vessels that caught greater amberjack	Number of trips that caught greater amberjack	Greater amberjack landings (lbs gw)	Other species' landings jointly caught with greater amberjack (lbs gw)	Number of SATL trips that only caught other species	Other species' landings on SATL trips without greater amberjack (lbs gw)
2012	249	2,063	925,820	1,234,821	6,192	3,144,165
2013	264	2,085	832,216	1,425,240	6,220	3,138,683
2014	269	2,469	929,228	1,326,672	7,316	3,416,356
2015	273	2,337	806,147	1,236,442	7,168	3,646,286
2016	260	1,971	757,311	936,387	7,493	3,513,761
Average	263	2,185	850,144	1,231,912	6,878	3,371,850

Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Table 3.3.1.8. Number of vessels and dockside revenues by year for vessels that landed greater amberjack from the South Atlantic, 2012-2016 (2016 dollars).

Year	Number of vessels that caught greater amberjack	Dockside revenue from greater amberjack	Dockside revenue from 'other species' jointly caught with greater amberjack	Dockside revenue from 'other species' caught on SATL trips without greater amberjack	Total dockside revenue	Average total dockside revenue per vessel
2012	249	$1,121,551	$4,018,343	$9,681,158	$14,821,052	$59,522
2013	264	$1,128,772	$4,891,111	$9,766,943	$15,786,826	$59,799
2014	269	$1,375,737	$4,817,537	$10,676,033	$16,869,307	$62,711
2015	273	$1,293,540	$4,399,200	$10,462,016	$16,154,756	$59,175
2016	260	$1,275,273	$3,342,430	$10,055,506	$14,673,209	$56,435
Average	263	$1,238,975	$4,293,724	$10,128,331	$15,661,030	$59,528

Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Red Porgy

Red porgy is within the porgies group (Sparidae) of the snapper grouper fishery, that includes 6 other species. Average monthly commercial landings of red porgy from 2012-2016 are displayed in **Figure 3.3.1.10**. The landings tend to be the highest in the summer and early falls months. There is a seasonal harvest closure from January through April each year. Among the South Atlantic states, commercial red porgy landings tend to be relatively evenly split among the states (**Figure 3.3.1.11**).

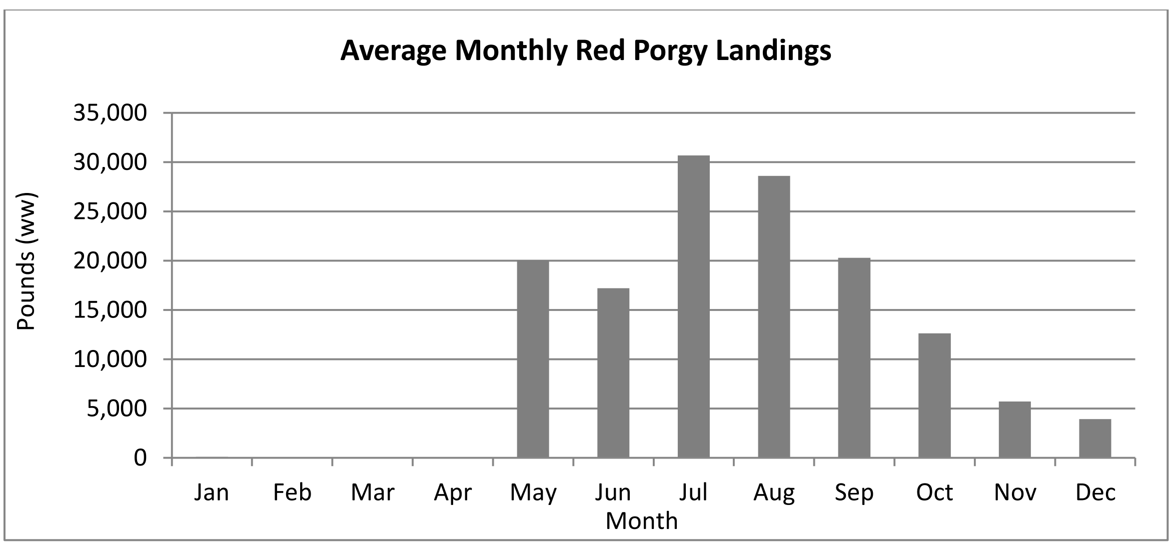

Figure 3.3.1.10. Average monthly commercial landings (lbs ww) of red porgy harvested from the South Atlantic, 2012-2016.
Source: NMFS Commercial ALS Dataset.

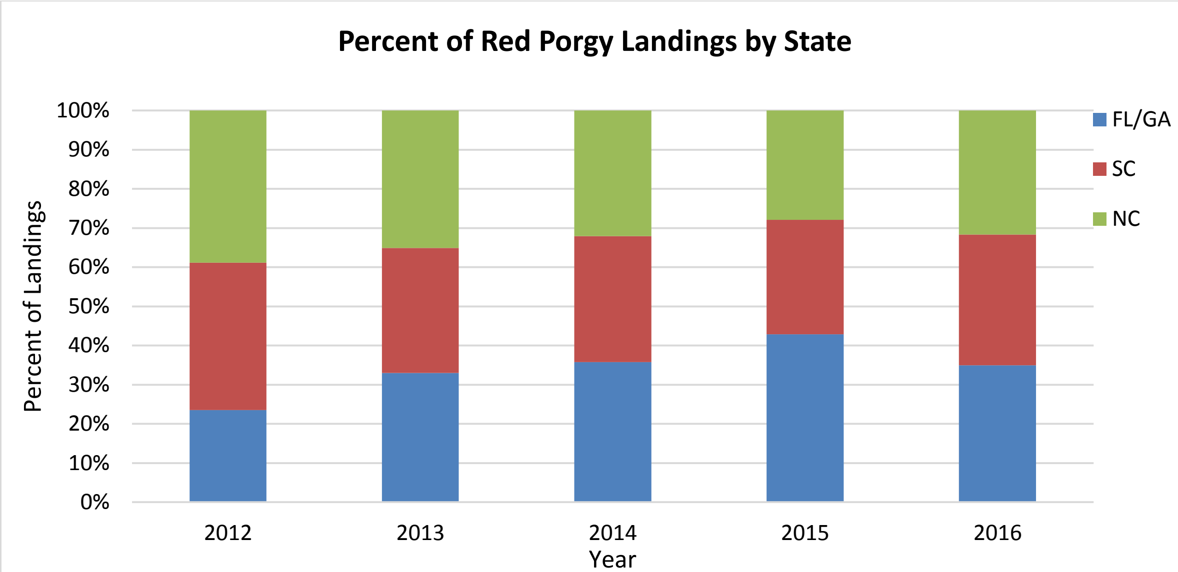

Figure 3.3.1.11. Percent of red porgy landings (lbs gw) by state, 2012-2016.
Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Annual commercial landings of red porgy in the South Atlantic ranged from approximately 101,000 lbs gw to 136,000 lbs gw and averaged 125,061 lbs gw from 2012 through 2016 (**Figure 3.3.1.12**, **Table 3.3.1.9**). Dockside revenues from those landings ranged from about $221,000 to $274,000 and averaged $261,313 (2016 dollars) (**Figure 3.3.1.12**, **Table 3.3.1.10**). The average dockside price during those five years was $2.10 per lb gw (2016 dollars) and an annual average of 160 vessels took 1,407 commercial trips landing red porgy. Average annual dockside revenue from red porgy landings represented approximately 5% of total dockside revenue from trips that landed red porgy from 2012 through 2016.

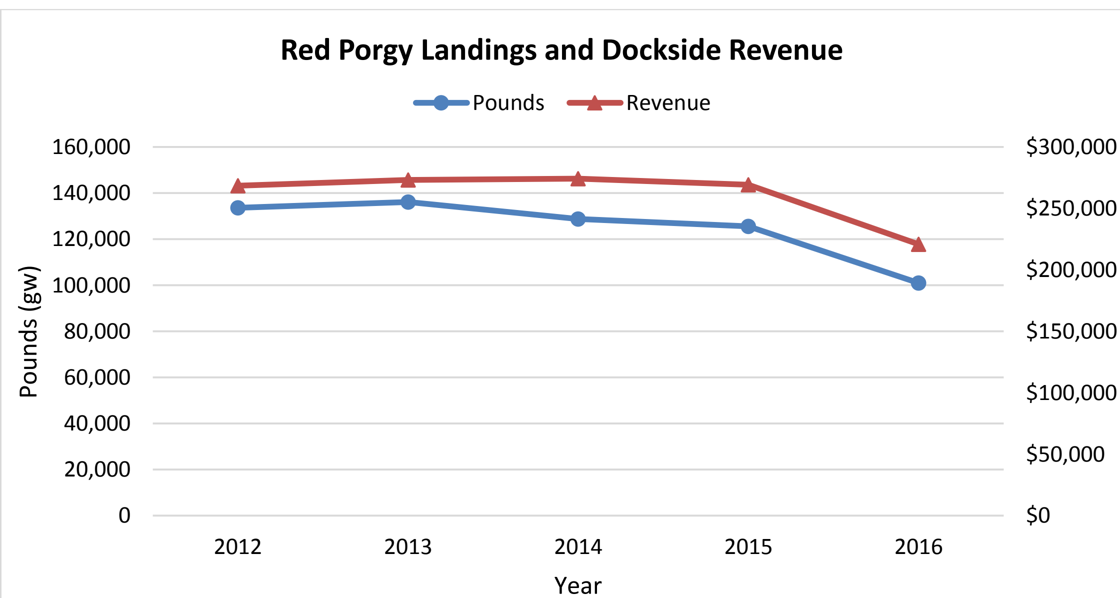

Figure 3.3.1.12. Annual commercial landings of red porgy by weight (lbs gw) and dockside revenue (2016 dollars), 2012–2016.
Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Table 3.3.1.9 Number of vessels, number of trips, and landings by year for vessels that landed red porgy from the South Atlantic, 2012-2016.

Year	Number of vessels that caught red porgy	Number of trips that caught red porgy	Red porgy landings (lbs gw)	Other species' landings jointly caught with red porgy (lbs gw)	Number of SATL trips that only caught other species	Other species' landings on SATL trips without red porgy (lbs gw)
2012	160	1,389	133,652	1,508,907	2,513	1,773,040
2013	170	1,533	136,166	1,617,082	3,188	2,196,471
2014	163	1,536	128,829	1,432,542	3,402	2,268,684
2015	159	1,350	125,587	1,290,301	3,346	2,394,907
2016	146	1,225	101,073	1,139,174	3,037	2,057,702
Average	160	1,407	125,061	1,397,601	3,097	2,138,161

Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Table 3.3.1.10. Number of vessels and dockside revenues by year for vessels that landed red porgy from the South Atlantic, 2012-2016 (2016 dollars).

Year	Number of vessels that caught red porgy	Dockside revenue from red porgy	Dockside revenue from 'other species' jointly caught with red porgy	Dockside from 'other species' caught on SATL trips without red porgy	Total dockside revenue	Average total dockside revenue per vessel
2012	160	$268,642	$5,007,697	$4,613,070	$9,889,409	$61,809
2013	170	$273,391	$5,602,505	$5,777,028	$11,652,924	$68,547
2014	163	$274,312	$4,981,739	$6,566,076	$11,822,127	$72,528
2015	159	$269,371	$4,558,484	$6,586,781	$11,414,636	$71,790
2016	146	$220,851	$4,029,409	$6,011,027	$10,261,287	$70,283
Average	160	$261,313	$4,835,967	$5,910,796	$11,008,077	$68,991

Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Vermilion Snapper

Vermilion snapper is within the snappers group (Lutjanidae) of the snapper grouper fishery that includes 13 other species. Average monthly commercial landings of vermilion snapper from 2012-2016 are displayed in **Figure 3.3.1.13**. The landings tend to be the highest in the January and February, and again in July, August, and September. This reflects the split season currently in place for vermilion snapper where half of the commercial annual catch limit is allocated January through June and half the annual catch limit is allocated July through December. The commercial fishery often closes in between the two seasons when the ACL has been met or is projected to be met. Among the South Atlantic states, South Carolina accounted for the majority of vermilion snapper landings initially (**Figure 3.3.1.14**). In recent years, Florida/Georgia has accounted for a larger share of the landings and in 2016 landings were split fairly evenly across the states.

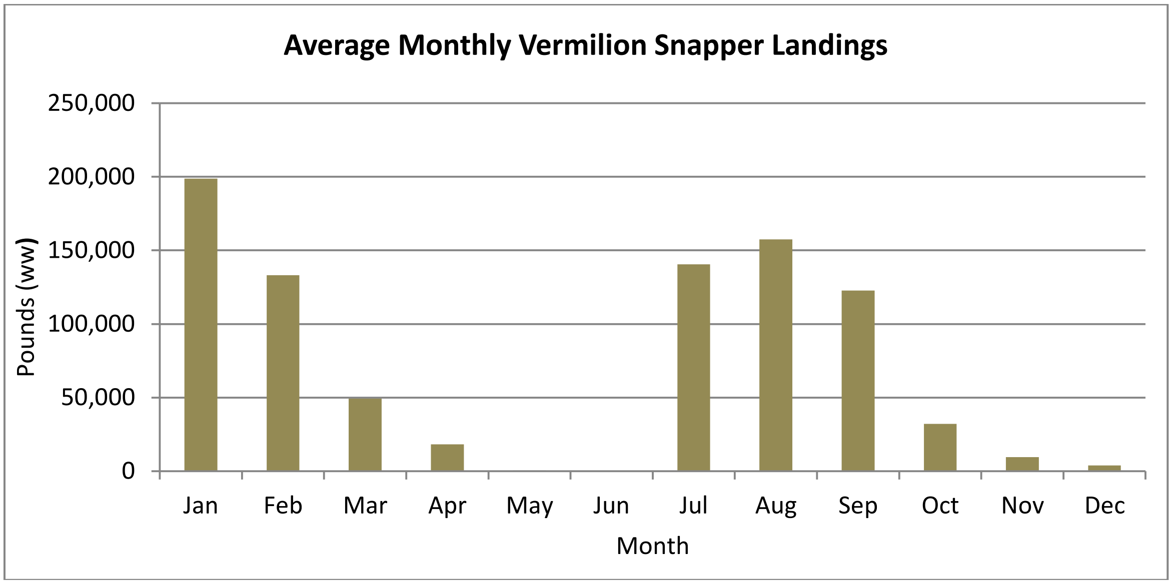

Figure 3.3.1.13. Average monthly commercial landings (lbs gw) of vermilion snapper harvested from the South Atlantic, 2012-2016.
Source: NMFS Commercial ALS Dataset.

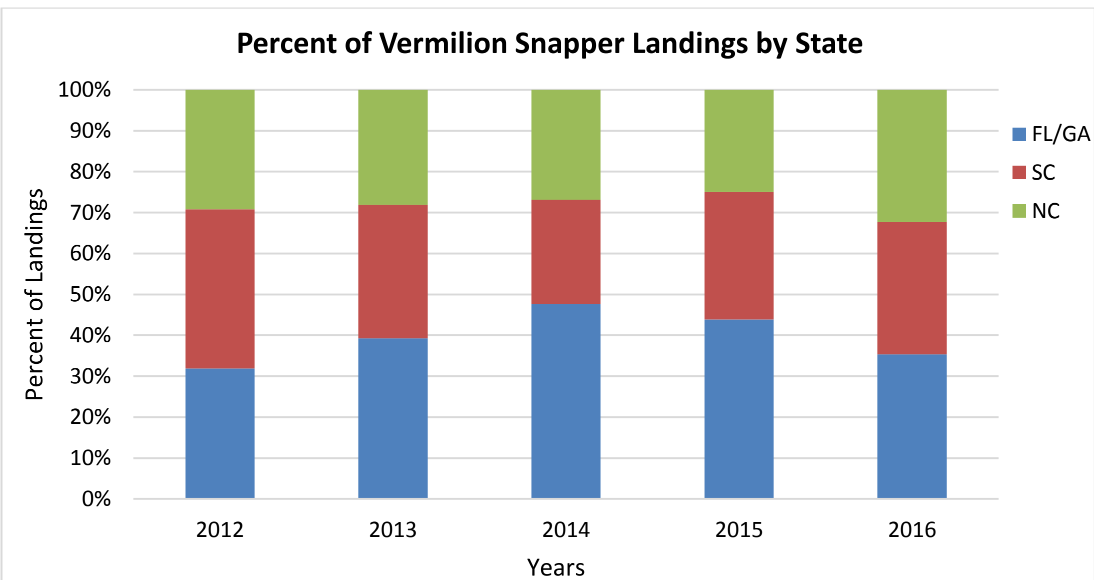

Figure 3.3.1.14. Percent of vermilion snapper landings (lbs gw) by state, 2012-2016.
Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Annual commercial landings of vermilion snapper in the South Atlantic ranged from approximately 755,000 lbs gw to 854,000 lbs gw and averaged 810,933 lbs gw from 2012 through 2016 (**Figure 3.3.1.15**, **Table 3.3.1.11**). Dockside revenues from those landings ranged from about $2,874,000 to $3,186,000 and averaged $3,047,823 (2016 dollars) (**Figure 3.3.1.15**, **Table 3.3.1.12**). The average dockside price during those five years was $3.76 per lb gw (2016 dollars) and an annual average of 206 vessels took 1,651 commercial trips landing vermilion snapper. Average annual dockside revenue from vermilion snapper landings represented approximately 54% of total dockside revenue from trips that landed vermilion snapper from 2012 through 2016.

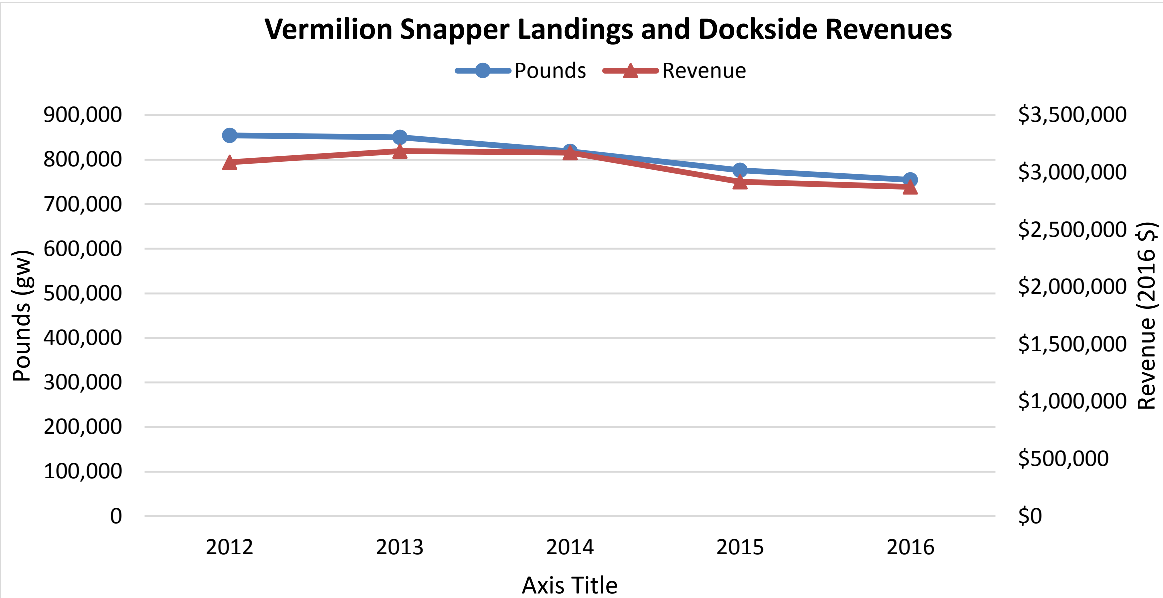

Figure 3.3.1.15. Annual commercial landings of vermilion snapper by weight (lbs gw) and dockside revenue (2016 dollars), 2012-2016.
Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Table 3.3.1.11. Number of vessels, number of trips, and landings by year for vessels that landed vermilion snapper from the South Atlantic, 2012-2016.

Year	Number of vessels that caught vermilion snapper	Number of trips that caught vermilion snapper	Vermilion snapper landings (lbs gw)	Other species' landings jointly caught with vermilion snapper (lbs gw)	Number of SATL trips that only caught other species	Other species' landings on SATL trips without vermilion snapper (lbs gw)
2012	189	1,352	854,493	839,842	3,608	2,279,943
2013	202	1,645	850,383	1,011,293	3,567	2,178,460
2014	220	1,798	818,992	979,867	5,460	2,920,601
2015	207	1,734	776,206	964,767	4,825	2,119,958
2016	213	1,725	754,593	950,594	4,816	2,316,806
Average	206	1,651	810,933	949,273	4,455	2,363,154

Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Table 3.3.1.12. Number of vessels and dockside revenues by year for vessels that landed vermilion snapper from the South Atlantic, 2012-2016 (2016 dollars).

Year	Number of vessels that caught vermilion snapper	Dockside revenue from vermilion snapper	Dockside revenue from 'other species' jointly caught with vermilion snapper	Dockside revenue from 'other species' caught on SATL trips without vermilion snapper	Total dockside revenue	Average total dockside revenue per vessel
2012	189	$3,088,786	$2,110,827	$6,100,983	$11,300,596	$59,792
2013	202	$3,186,161	$2,730,220	$6,810,067	$12,726,448	$63,002
2014	220	$3,171,748	$2,704,083	$9,467,984	$15,343,815	$69,745
2015	207	$2,918,025	$2,693,135	$6,990,548	$12,601,708	$60,878
2016	213	$2,874,395	$2,733,644	$6,657,724	$12,265,763	$57,586
Average	206	$3,047,823	$2,594,382	$7,205,461	$12,847,666	$62,200

Source: SEFSC Coastal Fisheries Logbook (January 2018).

Other Jacks Complex

The Other Jacks Complex (lesser amberjack, almaco jack, banded rudderfish) falls within the jacks group (Carangidae) of the snapper grouper fishery that includes 1 other species. Average monthly commercial landings of the Other Jacks Complex from 2012-2016 are displayed in **Figure 3.3.1.16**. The landings tend to be the highest in the late spring and early summer months, with the commercial landings for the complex typically dominated by almaco jack. Among the South Atlantic states, Florida/Georgia accounted for the majority of landings of the Other Jacks Complex (**Figure 3.3.1.17**).

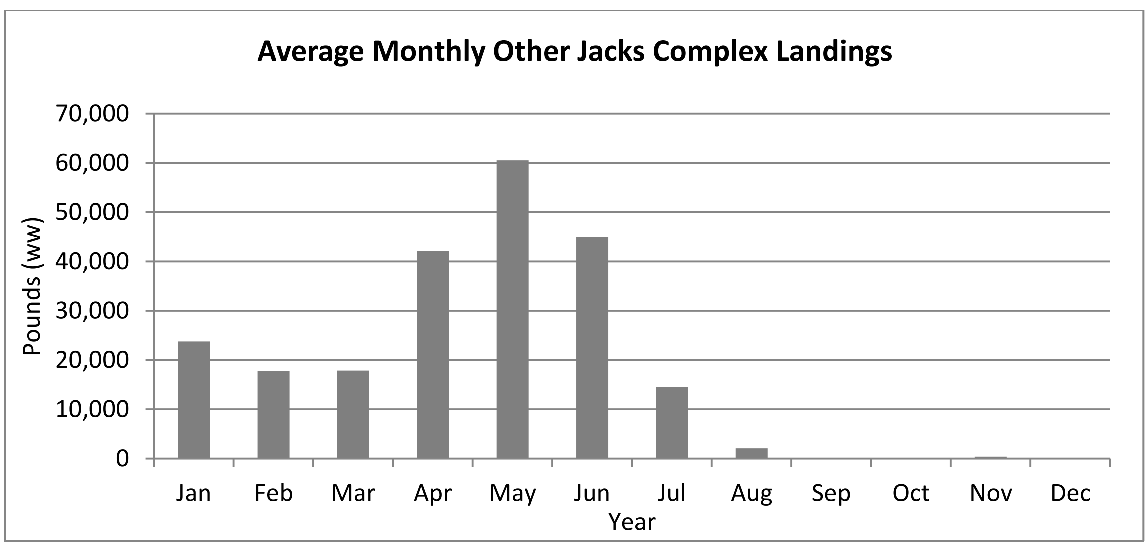

Figure 3.3.1.16. Average monthly commercial landings (lbs ww) of the other jacks complex harvested from the South Atlantic, 2012-2016.
Source: NMFS Commercial ALS Dataset.

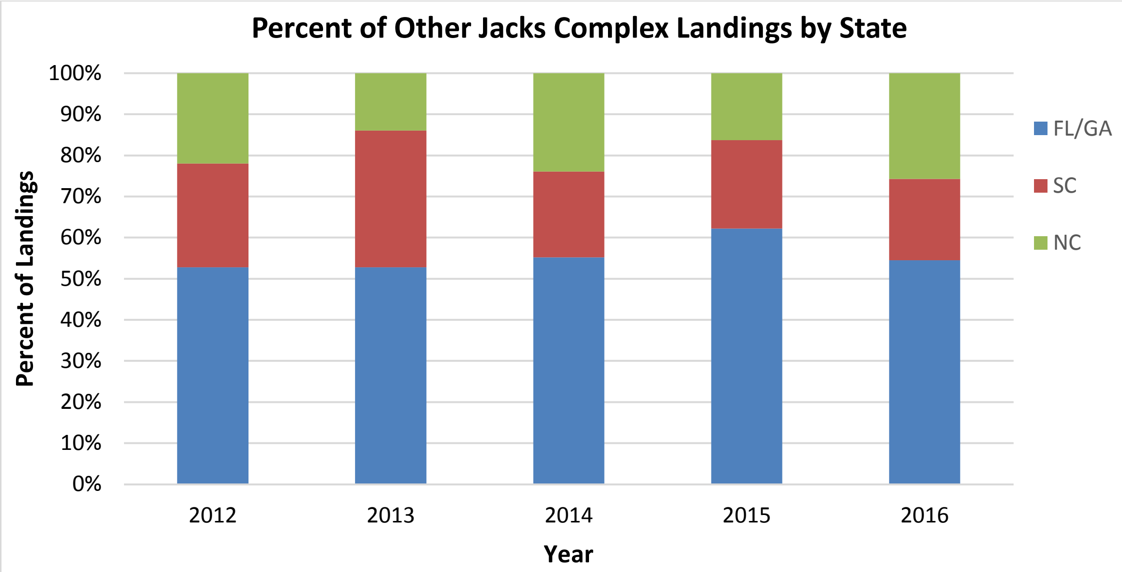

Figure 3.3.1.17. Percent of other jacks complex landings (lbs gw) by state, 2012-2016.
Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Annual commercial landings of the Other Jacks Complex in the South Atlantic ranged from approximately 173,000 lbs gw to 315,000 lbs gw and averaged 219,390 lbs gw from 2012 through 2016 (**Figure 3.3.1.18**, **Table 3.3.1.14**). Dockside revenues from those landings ranged from about $299,000 to $188,000 and averaged $230,536 (2016 dollars) (**Figure 3.3.1.18**, **Table 3.3.1.14**). The average dockside price during those five years was $1.06 per lb gw (2016 dollars) and an annual average of 210 vessels took 1,321 commercial trips landing species from the Other Jacks Complex. Average annual dockside revenue from landings of the Other Jacks Complex represented approximately 6% of total dockside revenue from trips that landed species from the other jacks complex from 2012 through 2016.

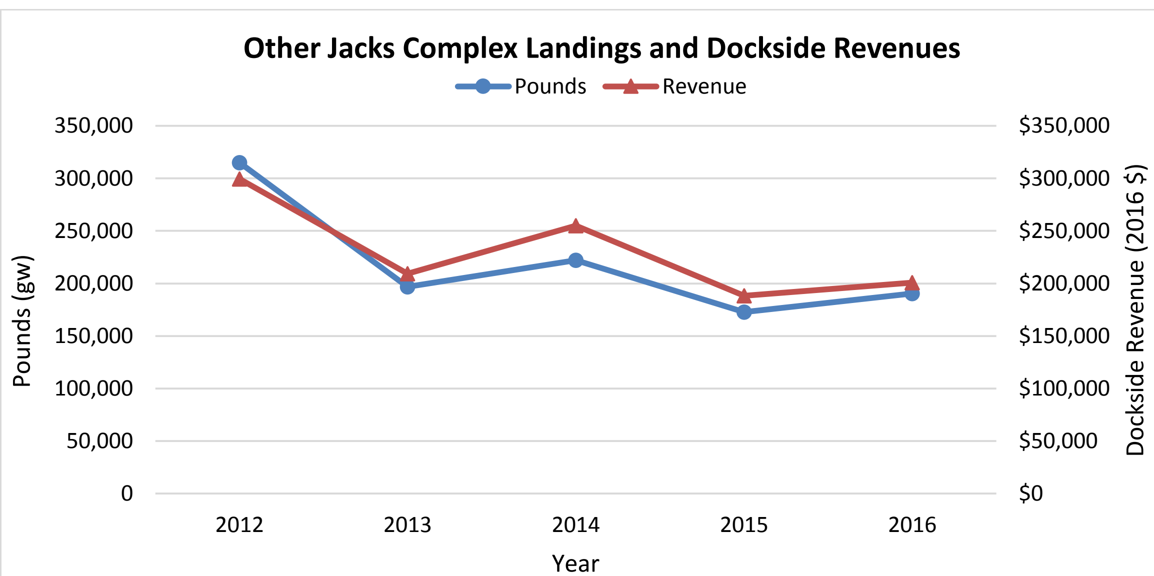

Figure 3.3.1.18. Annual commercial landings species from the other jacks complex by weight (lbs gw) and dockside revenue (2016 dollars), 2012-2016.
Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Table 3.3.1.13 Number of vessels, number of trips, and landings by year for vessels that landed species from the other jacks complex from the South Atlantic, 2012-2016.

Year	Number of vessels that caught species from the other jacks complex	Number of trips that caught species from the other jacks complex	Other jacks complex landings (lbs gw)	Other species' landings jointly caught with species from the other jacks complex (lbs gw)	Number of SATL trips that only caught other species	Other species' landings on SATL trips without species from the other jacks complex (lbs gw)
2012	220	1,339	315,032	1,213,997	5,850	3,236,418
2013	189	1,027	196,828	1,051,338	5,195	3,186,321
2014	209	1,420	221,986	1,301,135	6,500	3,398,601
2015	208	1,271	172,826	1,117,889	6,344	3,266,398
2016	223	1,550	190,280	1,366,361	6,292	3,345,800
Average	210	1,321	219,390	1,210,144	6,036	3,286,708

Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Table 3.3.1.14. Number of vessels and dockside revenues by year for vessels that landed species from the other jacks complex from the South Atlantic, 2012-2016 (2016 dollars).

Year	Number of vessels that caught species from the other jacks complex	Dockside revenue from species from the other jacks complex	Dockside revenue from 'other species' jointly caught with species from the other jacks complex	Dockside revenue from 'other species' caught on SATL trips without species from the other jacks complex	Total dockside revenue	Average total dockside revenue per vessel
2012	220	$299,444	$3,706,712	$9,144,860	$13,151,016	$59,777
2013	189	$209,346	$3,354,253	$9,657,719	$13,221,318	$69,954
2014	209	$254,976	$4,329,721	$10,132,679	$14,717,376	$70,418
2015	208	$188,149	$3,763,779	$9,533,670	$13,485,598	$64,835
2016	223	$200,763	$4,665,798	$8,838,717	$13,705,278	$61,459
Average	210	$230,536	$3,964,053	$9,461,529	$13,656,117	$65,289

Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Almaco Jack

Average monthly commercial landings of almaco jacks from 2012-2016 are displayed in **Figure 3.3.1.19**. Commercial landings tend to be the highest in May and June. Among the South Atlantic states, Florida/Georgia accounted for the majority of almaco jack landings (**Figure 3.3.1.20**), typically followed by South Carolina and North Carolina.

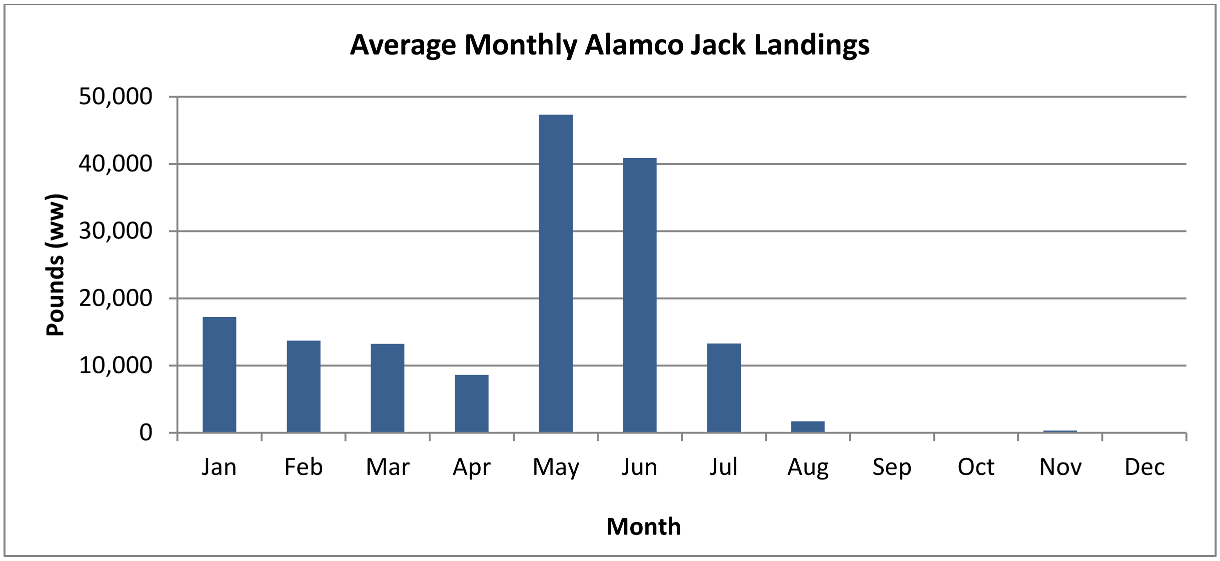

Figure 3.3.1.19. Average monthly commercial landings (lbs ww) of almaco jack harvested from the South Atlantic, 2012-2016.
Source: NMFS Commercial ALS Dataset.

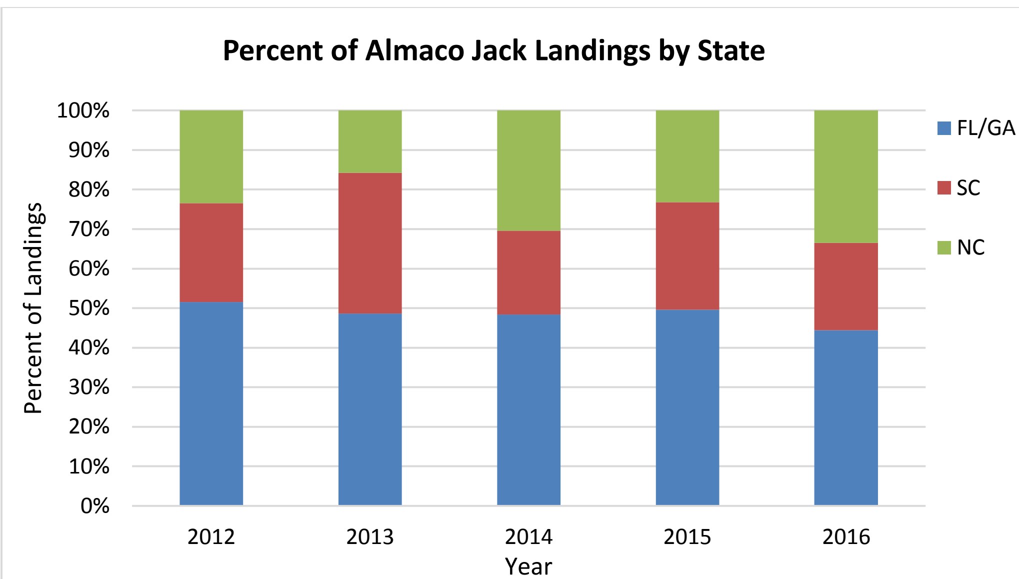

Figure 3.3.1.20. Percent of almaco jack landings (lbs gw) by state, 2012-2016.
Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Annual commercial landings of almaco jack in the South Atlantic ranged from approximately 110,000 lbs gw to 217,000 lbs gw and averaged 150,772 lbs gw from 2012 through 2016 (**Figure 3.3.1.21**, **Table 3.3.1.15**). Dockside revenues from those landings ranged from about $124,000 to $220,000 and averaged $164,908 (2016 dollars) (**Figure 3.3.1.21**, **Table 3.3.1.16**). The average dockside price during those five years was $1.10 per lb gw (2016 dollars) and an annual average of 165 vessels took 1,034 commercial trips landing almaco jack. Average annual dockside revenue from landings of almaco jack represented approximately 4% of total dockside revenue from trips that landed almaco jack from 2012 through 2016.

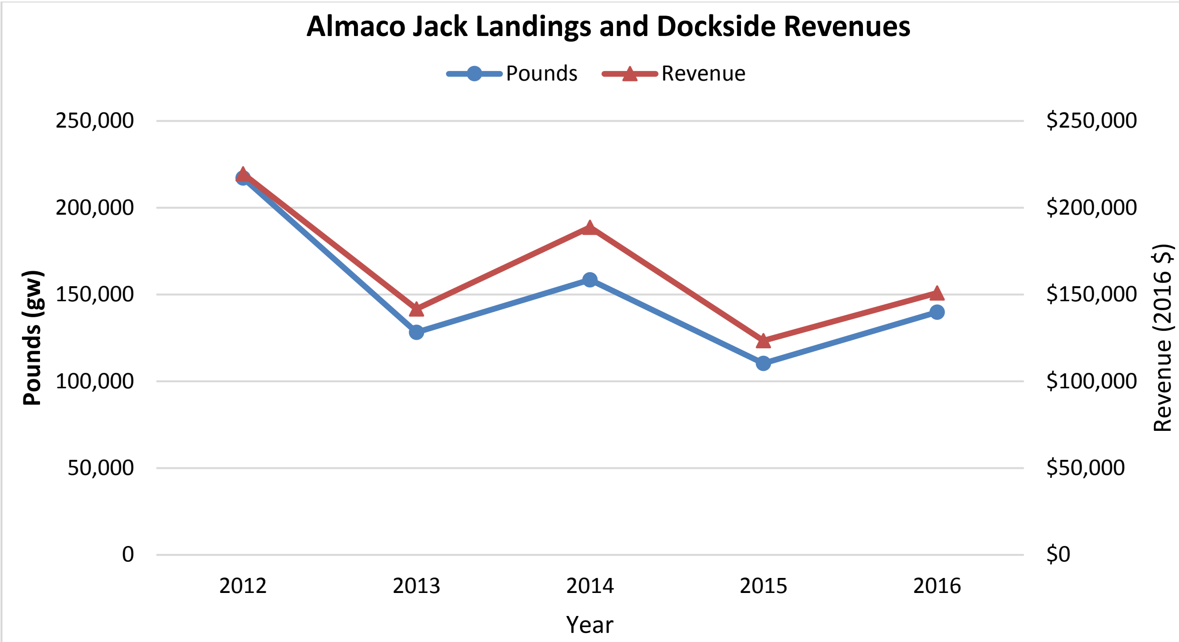

Figure 3.3.1.21. Annual commercial landings of almaco jack by weight (lbs gw) and dockside revenue (2016 dollars), 2012-2016.
Source: SEFSC Coastal Fisheries Logbook (January 2018).

Table 3.3.1.15 Number of vessels, number of trips, and landings by year for vessels that landed almaco jack from the South Atlantic, 2012-2016.

Year	Number of vessels that caught almaco jack	Number of trips that caught almaco jack	Almaco jack landings (lbs gw)	Other species' landings jointly caught with almaco jack (lbs gw)	Number of SATL trips that only caught other species	Other species' landings on SATL trips without almaco jack (lbs gw)
2012	167	998	217,106	1,113,893	4,220	2,713,820
2013	149	768	128,232	962,471	3,893	2,730,091
2014	160	1,066	158,510	1,098,473	5,129	3,119,402
2015	162	1,018	110,241	1,009,266	5,062	2,952,944
2016	186	1,318	139,772	1,271,872	5,118	2,988,056
Average	165	1,034	150,772	1,091,195	4,684	2,900,863

Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Table 3.3.1.16. Number of vessels and dockside revenues by year for vessels that landed almaco jack from the South Atlantic, 2012-2016 (2016 dollars).

Year	Number of vessels that caught almaco jack	Dockside revenue from almaco jack	Dockside revenue from 'other species' jointly caught with almaco jack	Dockside revenue from 'other species' caught on SATL trips without almaco jack	Total dockside revenue	Average total dockside revenue per vessel
2012	167	$219,563	$3,348,473	$7,933,954	$11,501,990	$68,874
2013	149	$141,765	$3,038,805	$8,586,970	$11,767,540	$78,977
2014	160	$188,775	$3,669,578	$9,435,855	$13,294,208	$83,089
2015	162	$123,495	$3,411,083	$8,626,438	$12,161,016	$75,068
2016	186	$150,942	$4,315,604	$8,049,989	$12,516,535	$67,293
Average	165	$164,908	$3,556,709	$8,526,641	$12,248,258	$74,660

Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Shallow Water Groupers

The shallow water groupers (gag grouper, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, graysby, coney) fall within the sea basses and groupers (Serranidae) group of the snapper grouper fishery that includes 10 other species. Average monthly commercial landings of shallow water groupers from 2012-2016 are displayed in **Figure 3.3.1.22**. The landings tend to be the highest in the in May and June, coinciding with the end of the spawning season closure that is in place annually from January through April. Among the South Atlantic states, landings of shallow water groupers (**Figure 3.3.1.23**) and are distributed fairly evenly. In the earlier years, the slight majority of landings occurred in North Carolina and South Carolina, with Georgia/Florida having the lowest share of the landings. By 2016, those roles had reversed with the most landings occurring in the Georgia/Florida region.

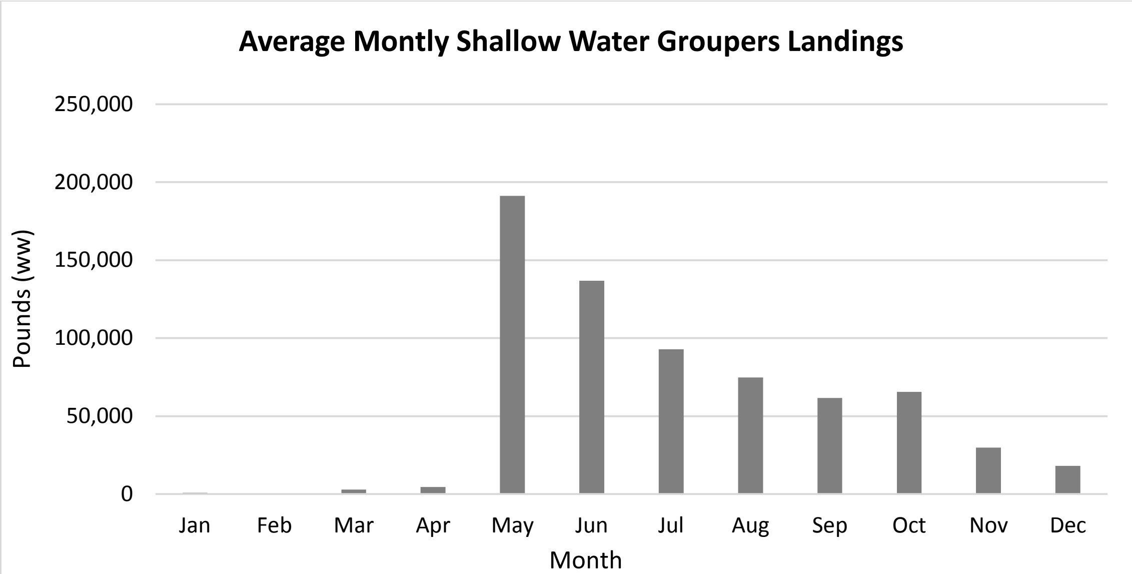

Figure 3.3.1.22. Average monthly commercial landings (lbs ww) of the shallow water groupers harvested from the South Atlantic, 2012-2016.
Source: NMFS Commercial ALS Dataset.

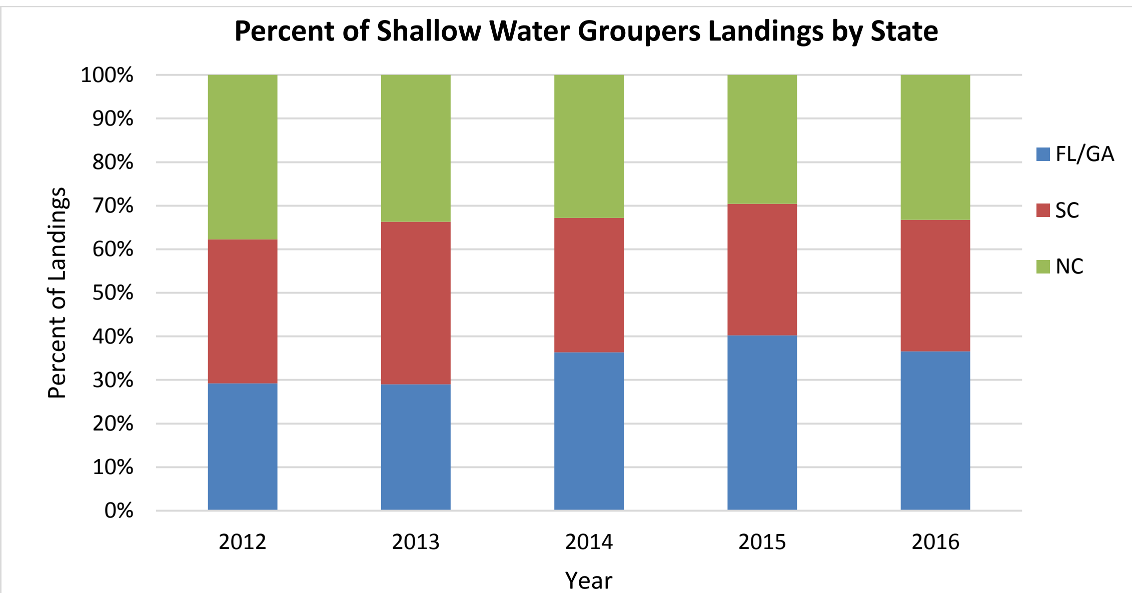

Figure 3.3.1.23. Percent of shallow water groupers landings (lbs gw) by state, 2012–2016.
Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Annual commercial landings of shallow water groupers in the South Atlantic ranged from approximately 410,000 lbs gw to 677,000 lbs gw and averaged 578,365 lbs gw from 2012 through 2016 (**Figure 3.3.1.24**, **Table 3.3.1.17**). Dockside revenues from those landings ranged from about $2,324,000 to $3,485,000 and averaged $3,096,396 (2016 dollars) (**Figure 3.3.1.24**, **Table 3.3.1.18**). The average dockside price during those five years was $5.39 per lb gw (2016 dollars) and an annual average of 357 vessels took 3,075 commercial trips landing shallow water groupers. Average annual dockside revenue from landings of shallow water groupers represented approximately 42% of total dockside revenue from trips that landed shallow water groupers from 2012 through 2016.

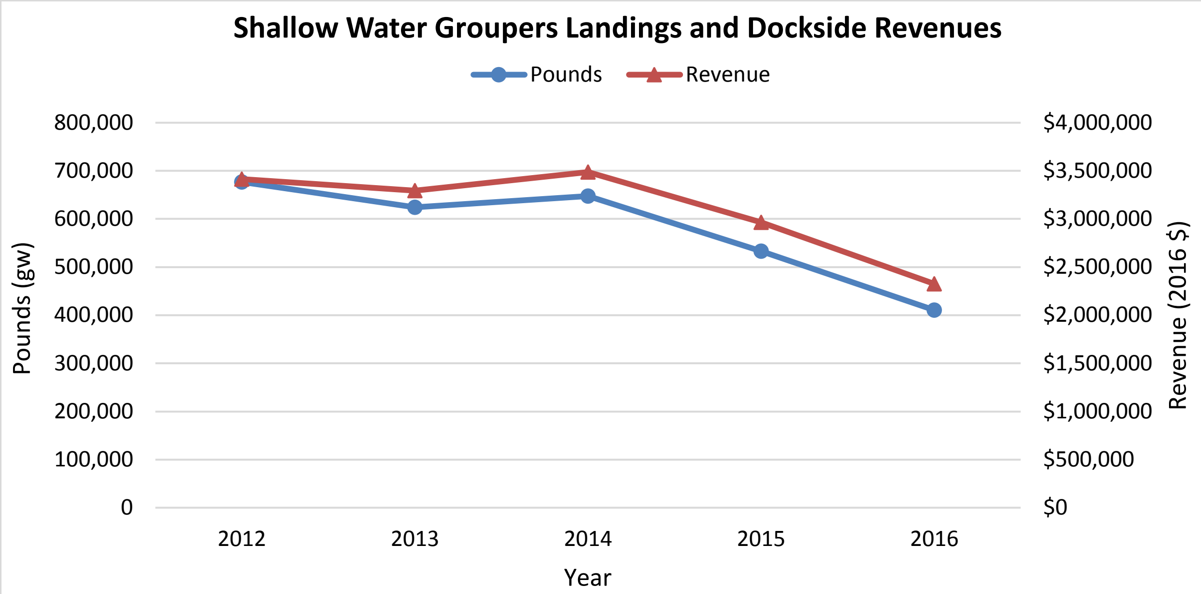

Figure 3.3.1.24. Annual commercial landings of shallow water groupers by weight (lbs gw) and dockside revenue (2016 dollars), 2012-2016.
Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Table 3.3.1.17 Number of vessels, number of trips, and landings by year for vessels that landed shallow water groupers from the South Atlantic, 2012-2016.

Year	Number of vessels that caught shallow water groupers	Number of trips that caught shallow water groupers	Shallow water groupers landings (lbs gw)	Other species' landings jointly caught with shallow water groupers (lbs gw)	Number of SATL trips that only caught other species	Other species' landings on SATL trips without shallow water groupers (lbs gw)
2012	364	2,912	676,476	1,522,471	7,871	3,967,559
2013	371	3,117	624,280	1,672,650	7,198	3,705,079
2014	364	3,462	647,716	1,589,459	9,091	4,224,789
2015	347	3,066	532,875	1,474,550	8,110	4,050,759
2016	338	2,820	410,480	1,356,854	8,742	4,021,145
Average	357	3,075	578,365	1,523,197	8,202	3,993,866

Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Table 3.3.1.18. Number of vessels and gross dockside revenues by year for vessels that landed shallow water groupers from the South Atlantic, 2012-2016 (2016 dollars).

Year	Number of vessels that caught shallow water groupers	Dockside revenue from shallow water groupers	Dockside revenue from 'other species' jointly caught with shallow water groupers	Dockside revenue from 'other species' caught on SATL trips without shallow water groupers	Total dockside revenue	Average total dockside revenue per vessel
2012	364	$3,413,111	$3,965,361	$10,000,858	$17,379,330	$47,745
2013	371	$3,292,901	$4,603,615	$10,287,976	$18,184,492	$49,015
2014	364	$3,485,430	$4,435,377	$12,158,156	$20,078,963	$55,162
2015	347	$2,966,003	$4,114,530	$10,927,183	$18,007,716	$51,895
2016	338	$2,324,537	$3,965,469	$11,235,838	$17,525,844	$51,852
Average	357	$3,096,396	$4,216,870	$10,922,002	$18,235,269	$51,134

Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Red Grouper

Average monthly commercial landings of red grouper from 2012-2016 are displayed in **Figure 3.3.1.25**. The landings tend to be the highest in May, coinciding with the end of the spawning season closure that is in place annually from January through April. Among the South Atlantic states, North Carolina accounted for the majority of red grouper landings at the beginning of the time series (**Figure 3.3.1.26**). Towards the end of the time series, landings of red grouper in North Carolina noticeably decreased, leading to Florida/Georgia accounting for a much larger portion of red grouper landings.

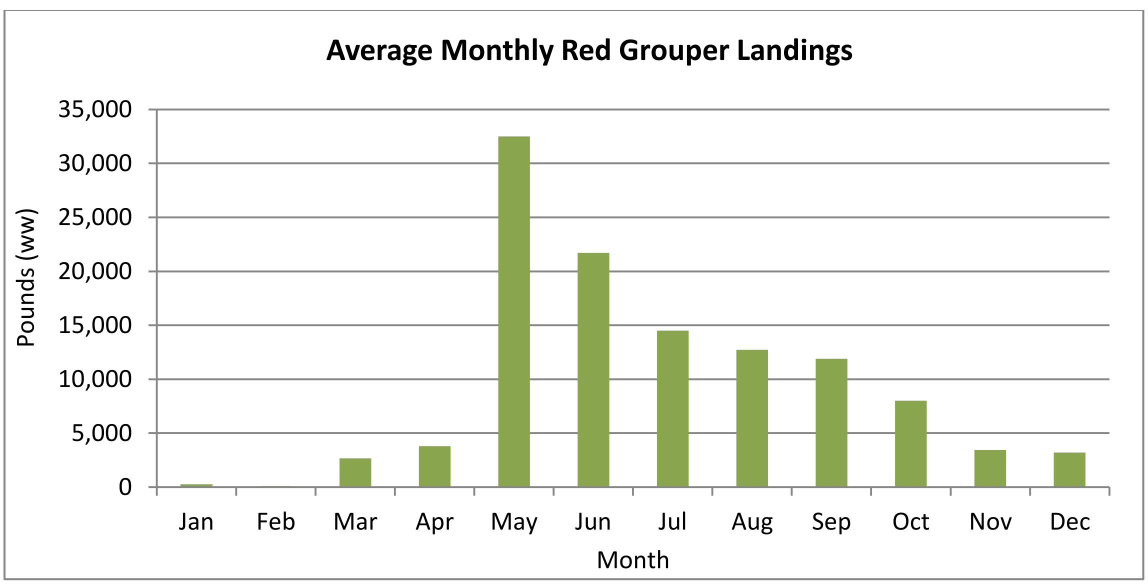

Figure 3.3.1.25. Average monthly commercial landings (lbs ww) of red grouper harvested from the South Atlantic, 2012-2016.
Source: NMFS Commercial ALS Dataset.

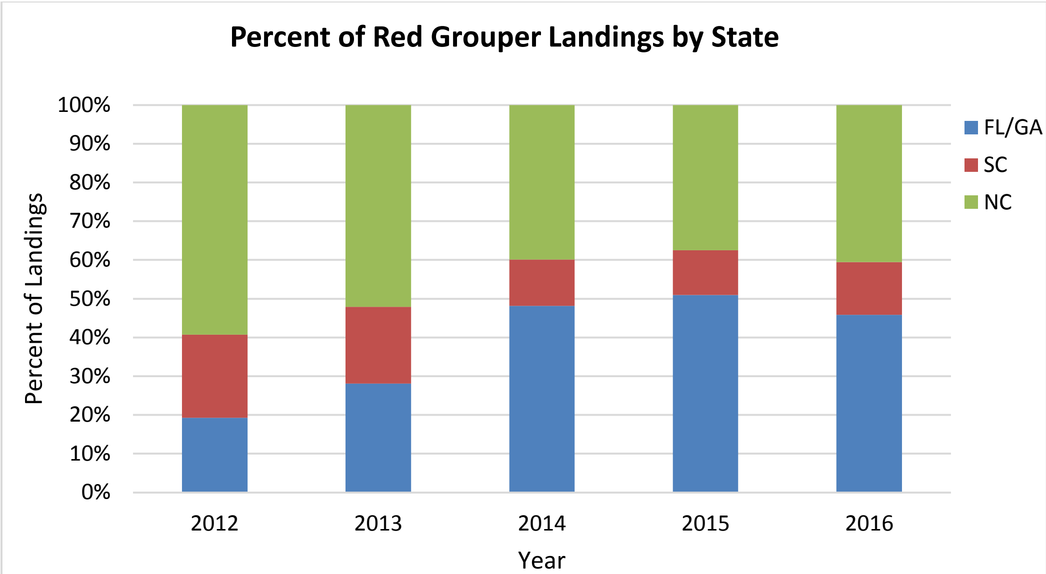

Figure 3.3.1.26. Percent of red grouper landings (lbs gw) by state, 2012-2016.
Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Annual commercial landings of red grouper in the South Atlantic ranged from approximately 40,000 lbs gw to 134,000 lbs gw and averaged 91,004 lbs gw from 2012 through 2016 (**Figure 3.3.1.27**, **Table 3.3.1.19**). Dockside revenues from those landings ranged from about $184,000 to $548,000 and averaged $392,078 (2016 dollars) (**Figure 3.3.1.27**, **Table 3.3.1.20**). The average dockside price during those five years was $4.36 per lb gw (2016 dollars) and an annual average of 240 vessels took 1,064 commercial trips landing red grouper. Average annual dockside revenue from landings of red grouper represented approximately 12% of total dockside revenue on trips that landed red grouper from 2012 through 2016.

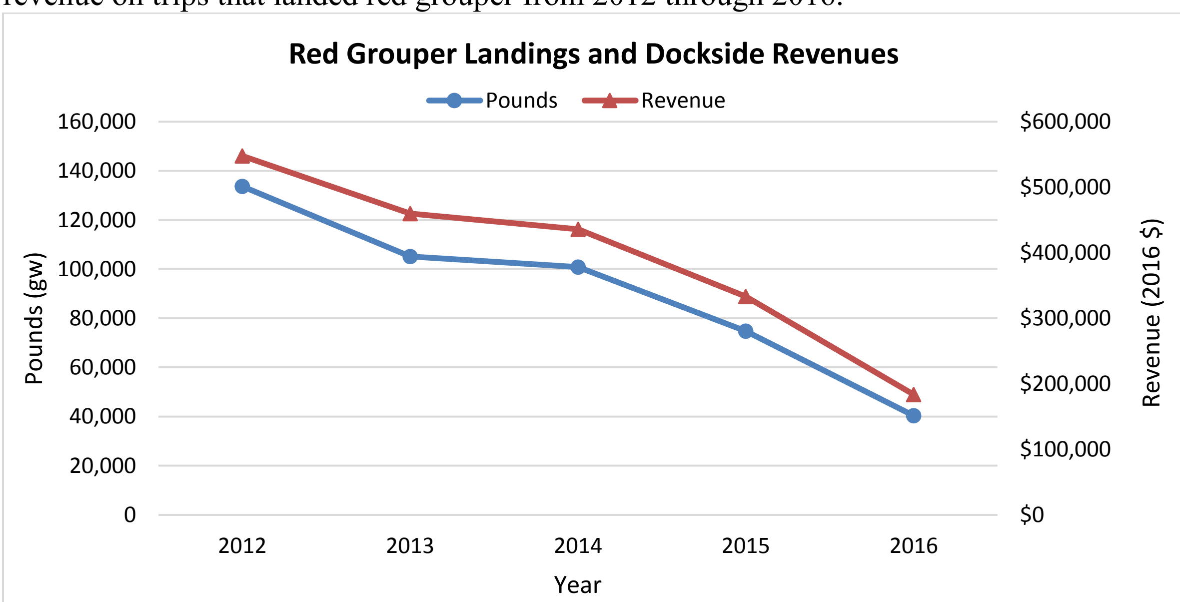

Figure 3.3.1.27. Annual commercial landings of red grouper by weight (lbs gw) and dockside revenue (2016 dollars), 2012-2016.
Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Table 3.3.1.19. Number of vessels, number of trips, and landings by year for vessels that landed red grouper from the South Atlantic, 2012-2016.

Year	Number of vessels that caught red grouper	Number of trips that caught red grouper	Red grouper landings (lbs gw)	Other species' landings jointly caught with red grouper (lbs gw)	Number of SATL trips that only caught other species	Other species' landings on SATL trips without red grouper (lbs gw)
2012	263	1,261	133,715	1,045,765	6,742	3,733,099
2013	253	1,143	105,195	905,574	5,915	3,499,090
2014	249	1,197	100,891	816,756	7,308	3,782,016
2015	226	940	74,811	661,443	6,584	3,613,072
2016	209	778	40,410	556,750	6,532	3,474,855
Average	240	1,064	91,004	797,258	6,616	3,620,426

Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Table 3.3.1.20. Number of vessels and dockside revenues by year for vessels that landed red grouper from the South Atlantic, 2012-2016 (2016 dollars).

Year	Number of vessels that caught red grouper	Dockside revenue from red grouper	Dockside revenue from 'other species' jointly caught with red grouper	Dockside revenue from 'other species' caught on SATL trips without red grouper	Total dockside revenue	Average total dockside revenue per vessel
2012	263	$547,887	$3,449,429	$10,383,169	$14,380,485	$54,679
2013	253	$459,954	$3,049,202	$10,688,887	$14,198,043	$56,119
2014	249	$435,901	$2,910,746	$12,172,726	$15,519,373	$62,327
2015	226	$333,144	$2,424,846	$11,194,570	$13,952,560	$61,737
2016	209	$183,502	$2,049,769	$10,943,104	$13,176,375	$63,045
Average	240	$392,078	$2,776,798	$11,076,491	$14,245,367	$59,581

Source: SEFSC Coastal Fisheries Logbook (May 2017).

Queen, Silk, and Blackfin Snappers

Queen, silk, and blackfin snapper fall within the Snappers (Lutjanidae) group of the snapper grouper fishery that includes 11 other species. Average monthly commercial landings of queen, silk, and blackfin snapper from 2012-2016 are displayed in **Figure 3.3.1.28**. The landings tend to be the highest in May, June, and July, but occur throughout the year. Among the South Atlantic states, landings of queen, silk, and blackfin snapper varied greatly over the five-year timeframe examined (**Figure 3.3.1.29**). In 2012, the majority of landings occurred in North Carolina, with Florida/Georgia and South Carolina accounting for a smaller share of the landings. In the other years examined, Florida/Georgia played a larger role in the commercial landings.

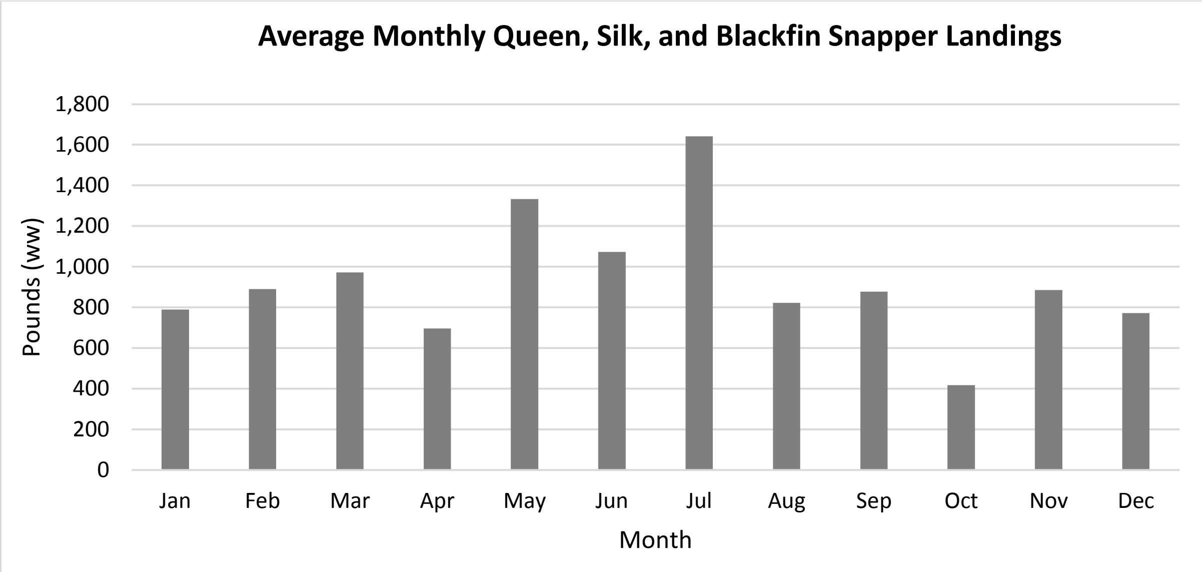

Figure 3.3.1.28. Average monthly commercial landings (lbs ww) of queen, silk, and blackfin snapper harvested from the South Atlantic, 2012-2016.
Source: NMFS Commercial ALS Dataset.

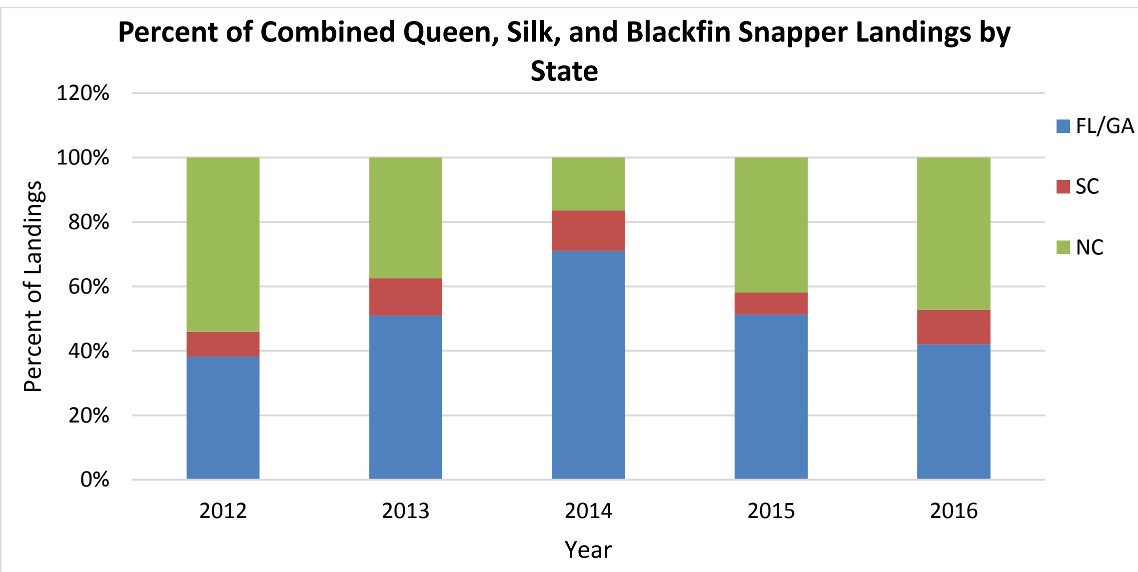

Figure 3.3.1.29. Percent of combined queen snapper, silk snapper, and blackfin snapper landings (lbs gw) by state, 2012-2016.
Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Annual commercial landings of queen, silk, and blackfin snapper in the South Atlantic ranged from approximately 7,000 lbs gw to 22,000 lbs gw and averaged 13,847 lbs gw from 2012 through 2016 (**Figure 3.3.1.30**, **Table 3.3.1.21**). Dockside revenues from those landings ranged from about $27,000 to $90,000 and averaged $53,750 (2016 dollars) (**Figure 3.3.1.30**, **Table 3.3.1.22**). The average dockside price during those five years was $3.84 per lb gw (2016 dollars) and an annual average of 93 vessels took 270 commercial trips landing queen, silk, and blackfin snapper. Average annual dockside revenue from landings of queen, silk, and blackfin snapper represented approximately 5% of total dockside revenue from trips that landed one or more of these snapper species from 2012 through 2016.

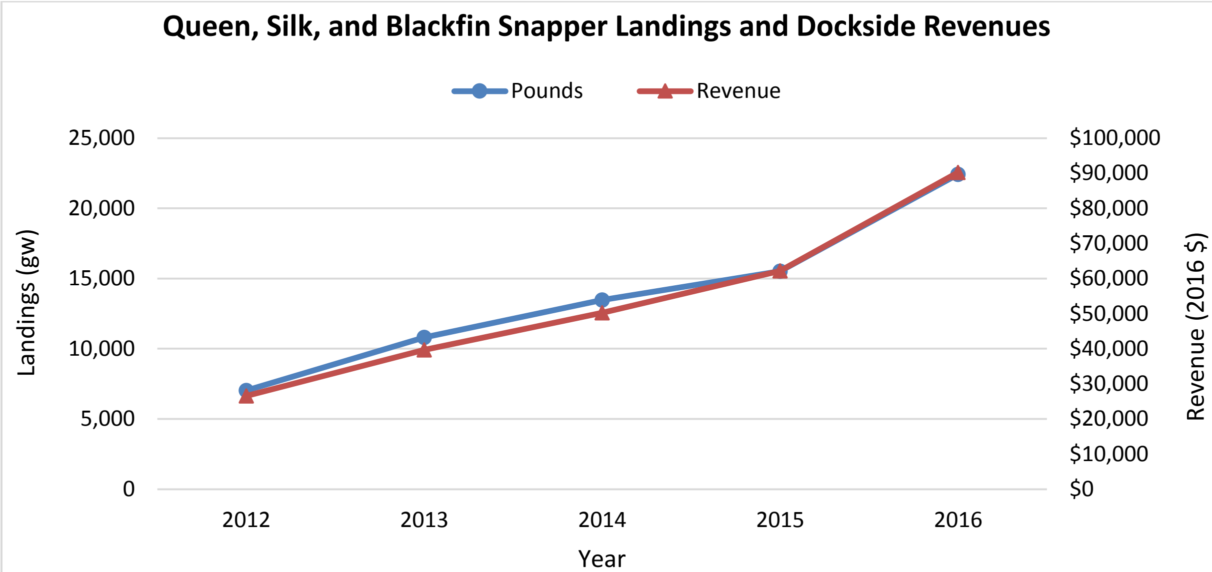

Figure 3.3.1.30. Annual commercial landings of queen, silk, and blackfin snapper by weight (lbs gw) and dockside revenue (2016 $).
Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Table 3.3.1.21. Number of vessels, number of trips, and landings by year for vessels that landed queen snapper, silk snapper, and blackfin snapper from the South Atlantic, 2012-2016.

Year	Number of vessels that caught queen, silk, and blackfin snapper	Number of trips that caught queen, silk, and blackfin snapper	Queen, silk, and blackfin snapper landings (lbs gw)	Other species' landings jointly caught with queen, silk, and blackfin snapper (lbs gw)	Number of SATL trips that only caught other species	Other species' landings on SATL trips without queen, silk, and blackfin snapper (lbs gw)
2012	93	224	7,024	265,159	2,448	2,109,752
2013	81	231	10,813	275,657	2,028	1,790,122
2014	87	191	13,478	235,346	2,743	2,218,366
2015	105	316	15,509	305,469	3,227	2,447,147
2016	101	388	22,410	395,130	3,462	2,219,329
Average	93	270	13,847	295,352	2,782	2,156,943

Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Table 3.3.1.22. Number of vessels and gross dockside revenues by year for vessels that landed queen, silk, and blackfin snapper from the South Atlantic, 2012-2016 (2016 dollars).

Year	Number of vessels that caught queen, silk, and blackfin snapper	Dockside revenue from queen, silk, and blackfin snapper	Dockside revenue from 'other species' jointly caught with queen, silk, and blackfin snapper	Dockside revenue from 'other species' caught on SATL trips without queen, silk, and blackfin snapper	Total dockside revenue	Average total dockside revenue per vessel
2012	93	$26,520	$774,654	$6,635,367	$7,436,541	$79,963
2013	81	$39,630	$834,724	$6,238,917	$7,113,271	$87,818
2014	87	$50,236	$723,400	$7,944,493	$8,718,129	$100,208
2015	105	$62,152	$1,027,938	$6,708,258	$7,798,348	$74,270
2016	101	$90,210	$1,308,518	$6,758,057	$8,156,785	$80,760
Average	93	$53,750	$933,847	$6,857,018	$7,844,615	$84,604

Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Gray Triggerfish

Gray triggerfish is within the triggerfishes group (Balistidae) of the snapper grouper fishery that includes 1 other species. Average monthly commercial landings of gray triggerfish from 2012-2016 are displayed in **Figure 3.3.1.31**. The landings tend to be the highest in the winter and spring months. Among the South Atlantic states, North Carolina accounted for the most gray triggerfish landings in most years (**Figure 3.3.1.32**).

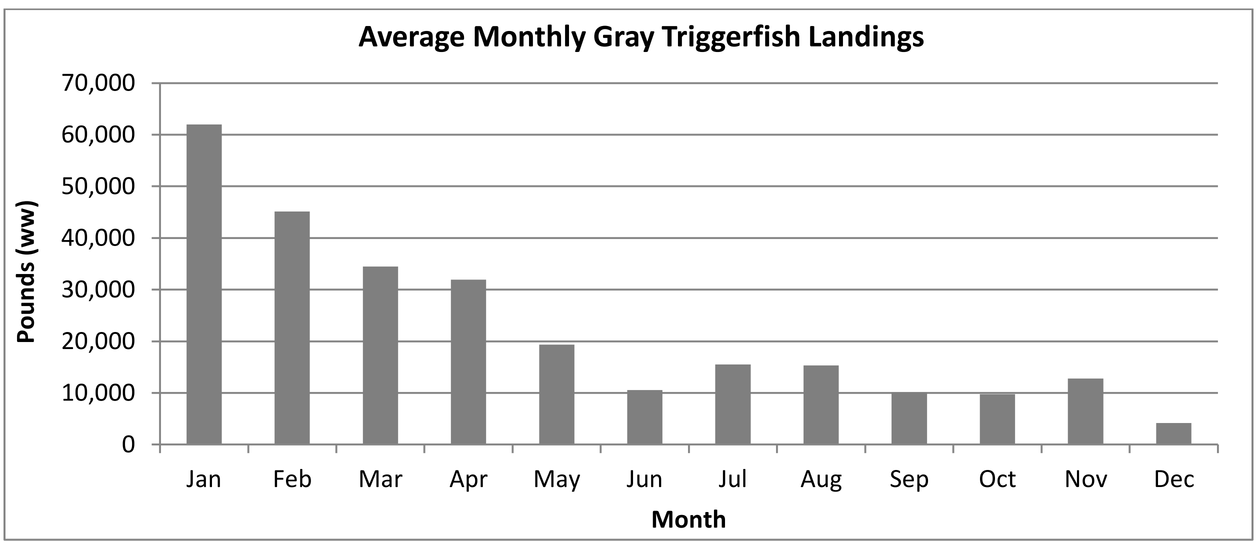

Figure 3.3.1.31. Average monthly commercial landings (lbs ww) of gray triggerfish harvested from the South Atlantic, 2012-2016.
Source: NMFS Commercial ALS Dataset.

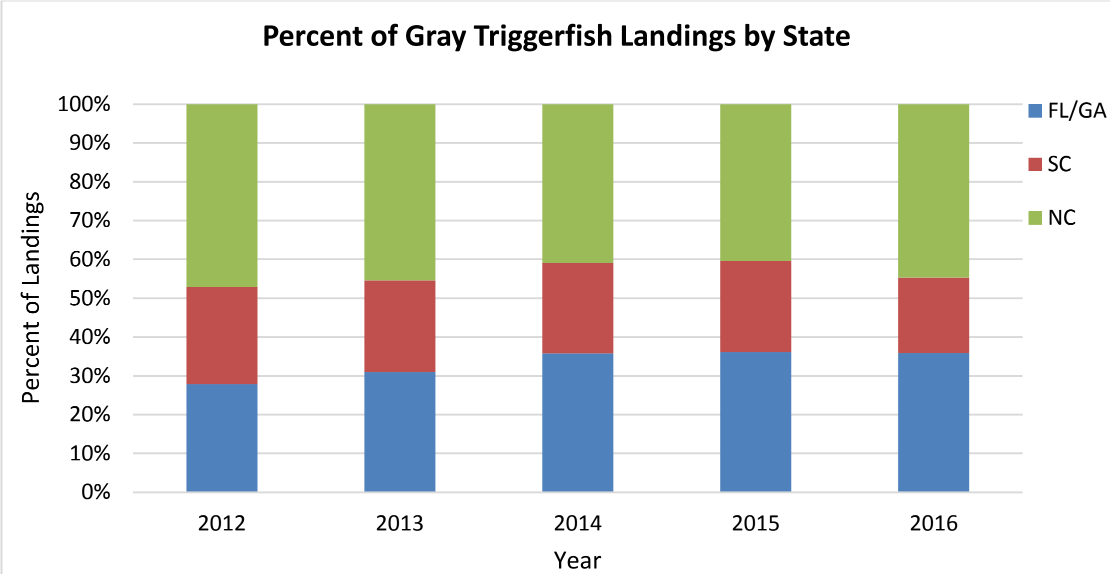

Figure 3.3.1.32. Percent of gray triggerfish landings (lbs gw) by state, 2012-2016.
Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Annual commercial landings of gray triggerfish in the South Atlantic ranged from approximately 241,000 lbs gw to 289,000 lbs gw and averaged 269,607 lbs gw from 2012 through 2016 (**Figure 3.3.1.33**, **Table 3.3.1.23**). Dockside revenues from those landings ranged from about $438,000 to $713,000 and averaged $593,491 (2016 dollars) (**Figure 3.3.1.33**, **Table 3.3.1.24**). The average dockside price during those five years was $2.21 per lb gw (2016 dollars) and an annual average of 212 vessels took 1,413 commercial trips landing gray triggerfish. Average annual dockside revenue from gray triggerfish landings represented approximately 14% of total dockside revenue from trips that landed gray triggerfish from 2012 through 2016.

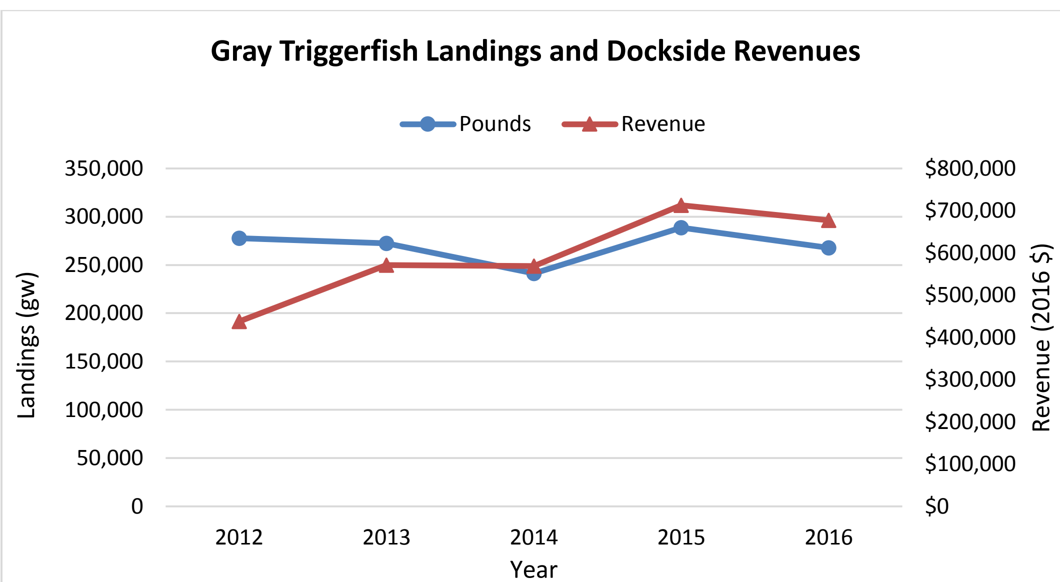

Figure 3.3.1.33. Annual commercial landings of gray triggerfish by weight (lbs gw) and dockside revenue (2016 dollars), 2012-2016.
Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Table 3.3.1.23 Number of vessels, number of trips, and landings by year for vessels that landed gray triggerfish from the South Atlantic, 2012-2016.

Year	Number of vessels that caught gray triggerfish	Number of trips that caught gray triggerfish	Gray triggerfish landings (lbs gw)	Other species' landings jointly caught with gray triggerfish (lbs gw)	Number of SATL trips that only caught other species	Other species' landings on SATL trips without gray triggerfish (lbs gw)
2012	245	1,742	277,843	1,623,481	6,298	3,315,499
2013	205	1,153	272,329	1,048,901	5,073	2,929,419
2014	197	979	241,185	732,971	6,338	3,613,085
2015	212	1,494	288,757	1,226,364	4,646	2,314,862
2016	203	1,698	267,922	1,418,487	4,762	2,381,907
Average	212	1413	269,607	1,210,041	5,423	2,910,954

Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

Table 3.3.1.24. Number of vessels and gross ex-vessel revenues by year for vessels that landed gray triggerfish from the South Atlantic, 2012-2016 (2016 dollars).

Year	Number of vessels that caught gray triggerfish	Dockside revenue from gray triggerfish	Dockside revenue from 'other species' jointly caught with gray triggerfish	Dockside revenue from 'other species' caught on SATL trips without gray triggerfish	Total dockside revenue	Average total dockside revenue per vessel
2012	245	$437,998	$5,121,085	$8,654,809	$14,213,892	$58,016
2013	205	$571,027	$3,397,669	$9,488,531	$13,457,227	$65,645
2014	197	$568,634	$2,457,846	$11,488,277	$14,514,757	$73,679
2015	212	$712,894	$4,185,681	$7,382,604	$12,281,179	$57,930
2016	203	$676,903	$4,888,508	$6,701,498	$12,266,909	$60,428
Average	212	$593,491	$4,010,158	$8,743,144	$13,346,793	$63,140

Source: SEFSC Coastal Fisheries Logbook (Accessed January 2018).

3.3.1.4 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 grouper species, imports affect the returns to fishermen through the ex-vessel prices they receive for their landings. As substitutes to domestic production of snappers and groupers, 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 and groupers, including the species in this amendment.

Snappers

Imports[5] of fresh snapper were 22.7 million lbs product weight (pw) in 2012. They increased steadily to 30.5 million lbs pw in 2016. Total revenue from fresh snapper imports increased from $69.4 million (2016 dollars) in 2012 to a five-year high of $90.2 million in 2016. Imports of fresh snapper primarily originated in Mexico or Central America, and entered the U.S. through the port of Miami. Imports of fresh snapper were highest on average (2012 through 2016) during the months March through July.

Imports of frozen snapper were substantially less than imports of fresh snapper from 2012 through 2016. The annual value of frozen snapper imports ranged from $25 million (2016 dollars) to $38 million during the time period, with a peak in 2016. Imports of frozen snapper primarily originated in South America (especially Brazil), Indonesia, Mexico, and Central America. The majority of frozen snapper imports entered the U.S. through the ports of Miami, New York, and San Juan. Imports of frozen snapper tended to be lowest during March through May when fresh snapper imports were high.

Groupers

Imports of fresh grouper were 9.2 million lbs pw in 2012. They increased to 11.5 million lbs pw in 2016. Total revenue from fresh grouper imports increased from $33.1 million (2016 dollars) in 2012 to a five-year high of $47.3 million in 2016. Imports of fresh grouper primarily originated in Mexico or Central America, and entered the U.S. through the ports of Tampa and Miami. Imports of fresh grouper were highest on average (2012 through 2016) during the months of January, July, and August.

Imports of frozen grouper were substantially less than imports of fresh grouper from 2012 through 2016. Imports of frozen grouper were 1.3 million lbs pw in 2012. They increased to 1.8 million lbs pw in 2014 before dropping to 0.8 million lbs pw. The annual value of frozen grouper imports ranged from $1.5 million (2016 dollars) to $3.7 million (2016 dollars) during the time period, with the peak in 2014. Imports of frozen grouper primarily originated in Mexico, India, and China. The majority of frozen grouper imports entered the U.S. through the ports of Tampa, Miami, and New York. Imports of frozen grouper were highest on average (2012 through 2016) during the months of February, March, and May.

3.3.1.5 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 vermilion 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 spend their money on substitute goods, such as other finfish or seafood

[5] NOAA Fisheries Service purchases fisheries trade data from the Foreign Trade Division of the U.S. Census Bureau. Data are available for download at http://www.st.nmfs.noaa.gov/st1/trade/index.html.

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 snapper grouper species in this amendment, and all species harvested by the vessels that harvested these species, were derived using the model[6] developed for and applied in NMFS (2017) and are provided in **Table 3.3.1.24-Table 3.3.1.35**. 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 in **Table 3.3.1.25** apply to a general reef fish category rather than just blueline tilefish, and a harvester job is "generated" for approximately every $32,000 (2016 dollars) in ex-vessel revenue. These results contrast with the number of harvesters (vessels) with recorded landings of blueline tilefish presented in **Table 3.3.1.4**.

Table 3.3.1.25. Average annual business activity (2012 through 2016) associated with the commercial harvest of blueline tilefish and the harvest of all species by vessels that landed blueline tilefish. All monetary estimates are in 2016 dollars.

Species	Average Ex-vessel Revenue ($ thousands)	Total Jobs	Harvester Jobs	Income Impacts ($ thousands)	Value-Added Impacts ($ thousands)	Output (Sales) Impacts ($ thousands)
Blueline tilefish	$467,774	62	15	$1,704	$2,407	$4,639
All species on all trips made by vessels that landed greater than one pound of blueline tilefish.	$10,450,723	1,395	331	$38,059	$53,774	$103,638

Source: Calculated by NMFS SERO using the model developed for and applied in NMFS (2017).

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

Table 3.3.1.26. Average annual business activity (2012 through 2016) associated with the commercial harvest of snowy grouper and the harvest of all species by vessels that landed snowy grouper. All monetary estimates are in 2016 dollars.

Species	Average Ex-vessel Revenue ($ thousands)	Total Jobs	Harvester Jobs	Income Impacts ($ thousands)	Value-Added Impacts ($ thousands)	Output (Sales) Impacts ($ thousands)
Snowy grouper	$488,813	65	15	$1,780	$2,515	$4,847
All species on all trips made by vessels that landed snowy grouper.	$11,903,323	1,589	377	$43,350	$61,248	$118,043

Source: Calculated by NMFS SERO using the model developed for and applied in NMFS (2017).

Table 3.3.1.27. Average annual business activity (2012 through 2016) associated with the commercial harvest of greater amberjack and the harvest of all species by vessels that landed greater amberjack. All monetary estimates are in 2016 dollars.

Species	Average Ex-vessel Revenue ($ thousands)	Total Jobs	Harvester Jobs	Income Impacts ($ thousands)	Value-Added Impacts ($ thousands)	Output (Sales) Impacts ($ thousands)
Greater amberjack	$1,238,975	165	39	$4,512	$6,375	$12,287
All species on all trips made by vessels that landed greater amberjack.	$15,661,030	2,091	496	$57,034	$80,583	$155,308

Source: Calculated by NMFS SERO using the model developed for and applied in NMFS (2017).

Table 3.3.1.28. Average annual business activity (2012 through 2016) associated with the commercial harvest of red porgy and the harvest of all species by vessels that landed red porgy. All monetary estimates are in 2016 dollars.

Species	Average Ex-vessel Revenue ($ thousands)	Total Jobs	Harvester Jobs	Income Impacts ($ thousands)	Value-Added Impacts ($ thousands)	Output (Sales) Impacts ($ thousands)
Red porgy	$261,313	35	8	$952	$1,345	$2,591
All species on all trips made by vessels that landed red porgy.	$11,008,077	1,470	349	$40,089	$56,641	$109,165

Source: Calculated by NMFS SERO using the model developed for and applied in NMFS (2017).

Table 3.3.1.29. Average annual business activity (2012 through 2016) associated with the commercial harvest of vermilion snapper and the harvest of all species by vessels that landed vermilion snapper. All monetary estimates are in 2016 dollars.

Species	Average Ex-vessel Revenue ($ thousands)	Total Jobs	Harvester Jobs	Income Impacts ($ thousands)	Value-Added Impacts ($ thousands)	Output (Sales) Impacts ($ thousands)
Vermilion snapper	$3,047,823	407	97	$11,100	$15,682	$30,225
All species on all trips made by vessels that landed vermilion snapper.	$12,847,666	1,715	407	$46,789	$66,107	$127,408

Source: Calculated by NMFS SERO using the model developed for and applied in NMFS (2017).

Table 3.3.1.30. Average annual business activity (2012 through 2016) associated with the commercial harvest of species within the other jacks complex and the harvest of all species by vessels that landed species within the other jacks complex. All monetary estimates are in 2016 dollars.

Species	Average Ex-vessel Revenue ($ thousands)	Total Jobs	Harvester Jobs	Income Impacts ($ thousands)	Value-Added Impacts ($ thousands)	Output (Sales) Impacts ($ thousands)
Other jacks complex	$230,536	31	7	$840	$1,186	$2,286
All species on all trips made by vessels that landed other jacks.	$13,656,117	1,823	433	$49,733	$70,267	$135,425

Source: Calculated by NMFS SERO using the model developed for and applied in NMFS (2017).

Table 3.3.1.31. Average annual business activity (2012 through 2016) associated with the commercial harvest of almaco jack and the harvest of all species by vessels that landed almaco jack. All monetary estimates are in 2016 dollars.

Species	Average Ex-vessel Revenue ($ thousands)	Total Jobs	Harvester Jobs	Income Impacts ($ thousands)	Value-Added Impacts ($ thousands)	Output (Sales) Impacts ($ thousands)
Almaco jack	$164,908	5	22	$601	$849	$1,635
All species on all trips made by vessels that landed almaco jack.	$12,248,258	388	1,635	$44,606	$63,023	$121,464

Source: Calculated by NMFS SERO using the model developed for and applied in NMFS (2017).

Table 3.3.1.32. Average annual business activity (2012 through 2016) associated with the commercial harvest of species of shallow water groupers and the harvest of all species by vessels that landed species of shallow water groupers. All monetary estimates are in 2016 dollars.

Species	Average Ex-vessel Revenue ($ thousands)	Total Jobs	Harvester Jobs	Income Impacts ($ thousands)	Value-Added Impacts ($ thousands)	Output (Sales) Impacts ($ thousands)
Shallow water groupers	$3,096,396	413	98	$11,276	$15,932	$30,706
All species on all trips made by vessels that landed shallow water groupers.	$18,235,269	2,434	578	$66,409	$93,829	$180,836

Source: Calculated by NMFS SERO using the model developed for and applied in NMFS (2017).

Table 3.3.1.33. Average annual business activity (2012 through 2016) associated with the commercial harvest of red grouper and the harvest of all species by vessels that landed red grouper. All monetary estimates are in 2016 dollars.

Species	Average Ex-vessel Revenue ($ thousands)	Total Jobs	Harvester Jobs	Income Impacts ($ thousands)	Value-Added Impacts ($ thousands)	Output (Sales) Impacts ($ thousands)
Red grouper	$392,078	52	12	$1,428	$2,017	$3,888
All species on all trips made by vessels that landed red grouper	$14,245,367	1,903	452	$51,912	$73,345	$141,358

Source: Calculated by NMFS SERO using the model developed for and applied in NMFS (2017).

Table 3.3.1.34. Average annual business activity (2012 through 2016) associated with the commercial harvest of queen, silk, and blackfin snapper and the harvest of all species by vessels that landed queen, silk, and blackfin snapper. All monetary estimates are in 2016 dollars.

Species	Average Ex-vessel Revenue ($ thousands)	Total Jobs	Harvester Jobs	Income Impacts ($ thousands)	Value-Added Impacts ($ thousands)	Output (Sales) Impacts ($ thousands)
Queen, silk, and blackfin snapper	$53,750	7	2	$196	$277	$533
All species on all trips made by vessels that landed queen, silk, and blackfin snapper	$7,844,615	1,047	249	$28,569	$40,364	$77,794

Source: Calculated by NMFS SERO using the model developed for and applied in NMFS (2017).

Table 3.3.1.35. Average annual business activity (2012 through 2016) associated with the commercial harvest of gray triggerfish and the harvest of all species by vessels that landed gray triggerfish. All monetary estimates are in 2016 dollars.

Species	Average Ex-vessel Revenue ($ thousands)	Total Jobs	Harvester Jobs	Income Impacts ($ thousands)	Value-Added Impacts ($ thousands)	Output (Sales) Impacts ($ thousands)
Gray triggerfish	$593,491	79	19	$2,161	$3,054	$5,886
All species on all trips made by vessels that landed gray triggerfish	$13,346,793	1,782	423	$48,606	$68,675	$132,358

Source: Calculated by NMFS SERO using the model developed for and applied in NMFS (2017).

3.4 Social Environment

Since 2001, South Atlantic Snapper Grouper Unlimited Permits and Snapper Grouper 225-pound Trip Limit Permits have shown a downward trend (**Figure 3.4.1**) as would be expected with a limited entry program in place since 1998 and a "2 for 1" requirement for new permits. That trend will likely continue as long as the criteria are a continued part of management for the snapper grouper commercial fishery. The decline in the number of permits has slowed in recent years but continues to trend lower with the number of unlimited permits in 2013 going from 593 to 565 in 2016 and limited permits dropping from 130 in 2013 to 116 in 2016.

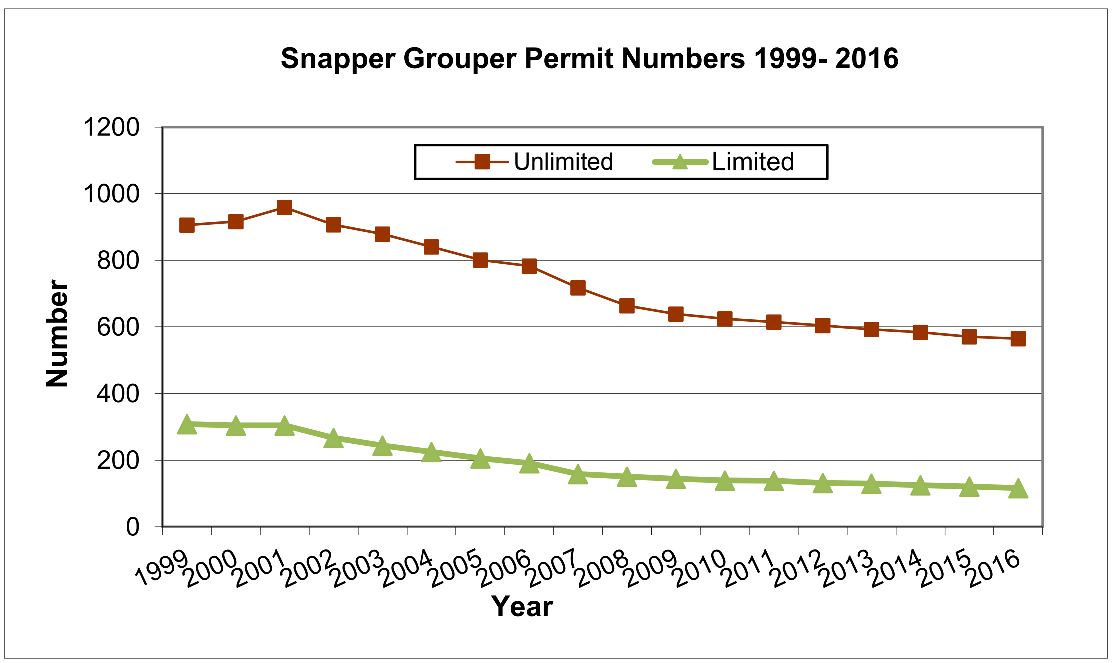

Figure 3.4.1. Snapper grouper Unlimited and 225-pound trip limit permits 1999-2016. Source: NMFS SERO Permits (2017).

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

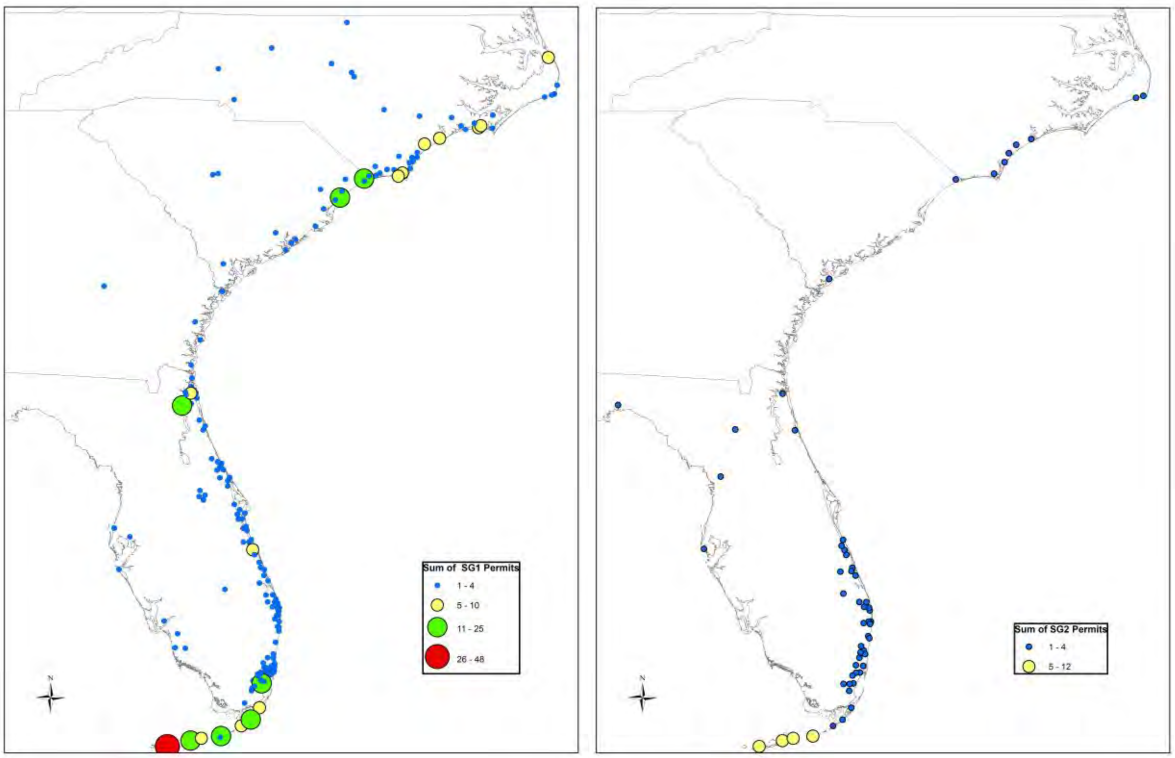

Figure 3.4.2. Snapper grouper unlimited and limited permits by owner's zip code.
Source: NMFS SERO Permits (2017).

A regional quotient (RQ) measure was used to identify commercial fishing involvement at the community level by species or species group. The RQ measures the relative importance of a given species or species group across all communities in the region and represents the proportional distribution of commercial landings. This proportional measure does not provide the actual number of pounds or the value of the catch; data that might be confidential at the community level. The RQ is calculated by dividing the total pounds (or value) of a species landed in a given community, by the total pounds (or value) for that species for all communities in the region. The measure is a way to quantify the importance of a particular species or species group to communities around the South Atlantic and suggest where impacts from management actions are more likely to be experienced. The time series for the describing the RQ was from 2005 to 2014. The data used for the RQ measure were assembled from the accumulated landings system (ALS), which includes commercial landings of all species from both state and federal waters and is based on dealers' reports. These data were converted to provide landings by (dealer's) address.

Blueline Tilefish

The communities that are most highly involved in the **blueline tilefish** fishery are listed in **Figure 3.4.3**. For most communities, involvement in the blueline tilefish fishery has remained fairly stable over time. Yet, some communities, like Wanchese, NC has seen some rather significant swings in participation over time with a spike in landings in 2008 and 2009 and a steep decline since. Little River, SC was the top community in 2005 and saw a decline in landings in 2008 and 2009, but most recently has seen a rise in RQ and is second to Port Orange Florida, which has seen a steady rise in its RQ since 2009.

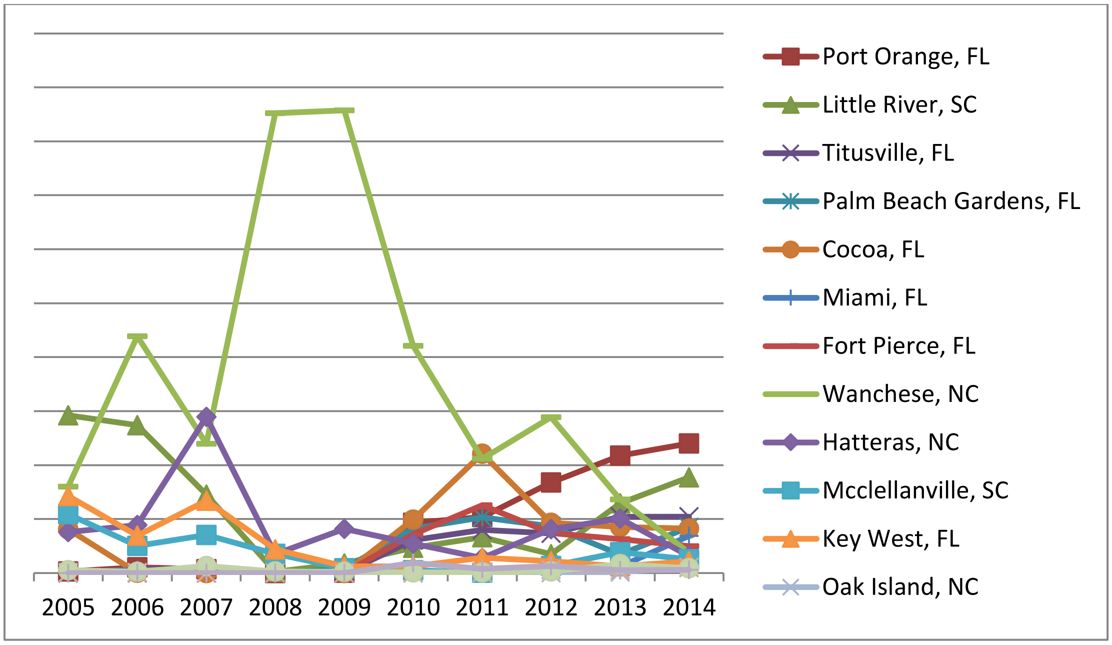

Figure.3.4.3. Blueline Tilefish community RQ for pounds from 2005 to 2014 ranked initially by 2014 top ten.
Source: NMFS SERO ALS Database (with dealer address) (2017).

Snowy Grouper

The communities involved in harvesting **snowy grouper** (**Figure 3.4.4**) demonstrate some large fluctuations in RQ similar to those seen in blueline tilefish. The community of Key West, FL has remained the top community, but has seen dramatic increases and declines in RQ over time. Little River, SC has also seen substantial changes over time, but not of the same magnitude as Key West. Many communities have seen a recent increase in their landings since 2012.

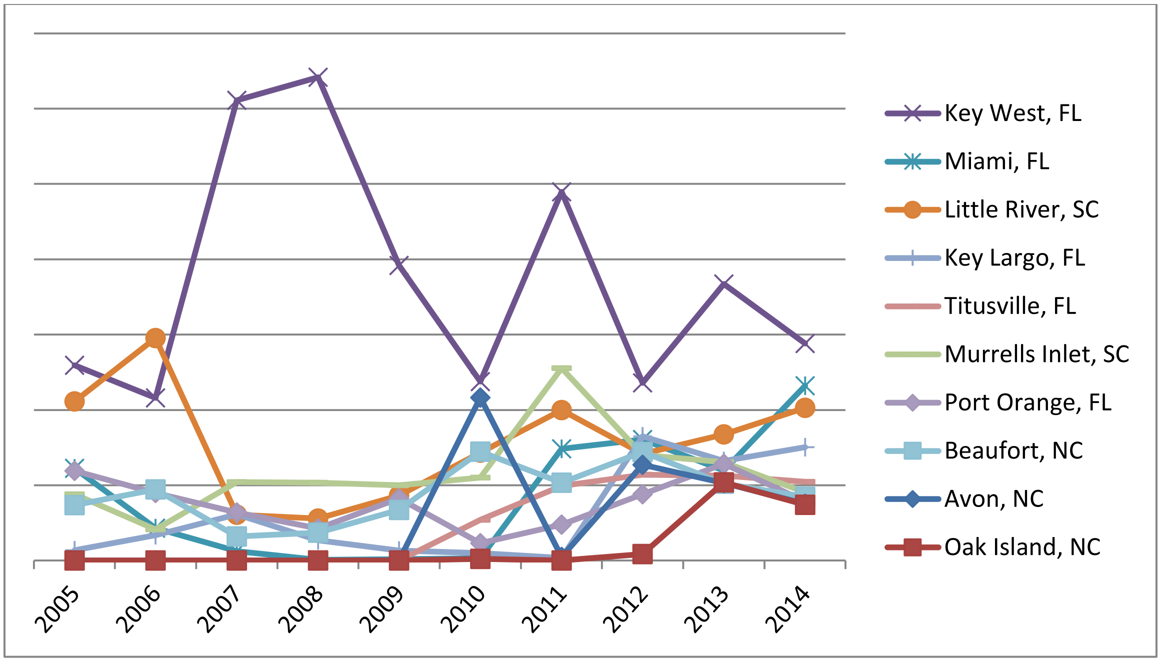

Figure.3.4.4. Snowy grouper community RQ for pounds from 2005 to 2014 ranked initially by 2014 top ten.
Source: NMFS SERO ALS Database

Greater Amberjack

Communities harvesting **greater amberjack** seem to also demonstrate large fluctuations over time in their harvesting of that species (**Figure 3.4.5**). The community of Key West, FL is the top community in 2014 and was in 2005, but was surpassed by Cocoa, FL in 2011, but has since seen a big increase in RQ since then. Cocoa, FL, on the other hand, has seen a significant drop in its RQ since then but still ranks third in RQ in 2014. Mayport, FL was once ranked fifth in terms of its RQ for greater amberjack and is ranked second in 2014. The community of Islamorada, FL was third in 2005 and has since dropped to sixth in terms of its RQ for greater amberjack.

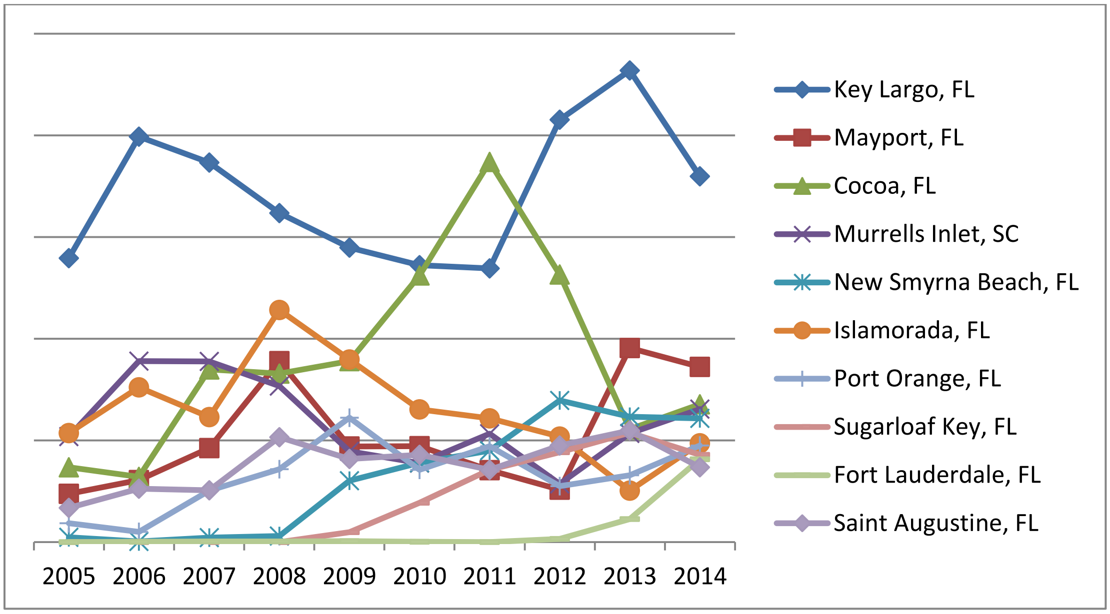

Figure.3.4.5. Greater amberjack community RQ for pounds from 2005 to 2014 ranked initially by 2014 top ten.
Source: NMFS SERO ALS Database (with dealer address) (2017).

Red Porgy

The top communities currently involved in the harvest of **red porgy** are depicted in **Figure 3.4.6**. The red porgy fishery does not exhibit swings in RQ as great as those in blueline tilefish, but there are some communities with substantial increases and decreases over time. The community of Mayport has seen a rather steady increase in its landings of red porgy since 2005 and is now ranked ahead of Murrell's Inlet, SC which had held to the top spot for most of the timeframe. The community of Southport, NC once was the top community in red porgy landings but has seen a steady decline and now ranks just below St. Augustine, FL. Supply, NC saw a significant drop in 2009 from which it has only recently recovered and is now even with Beaufort, NC and Charleston, SC.

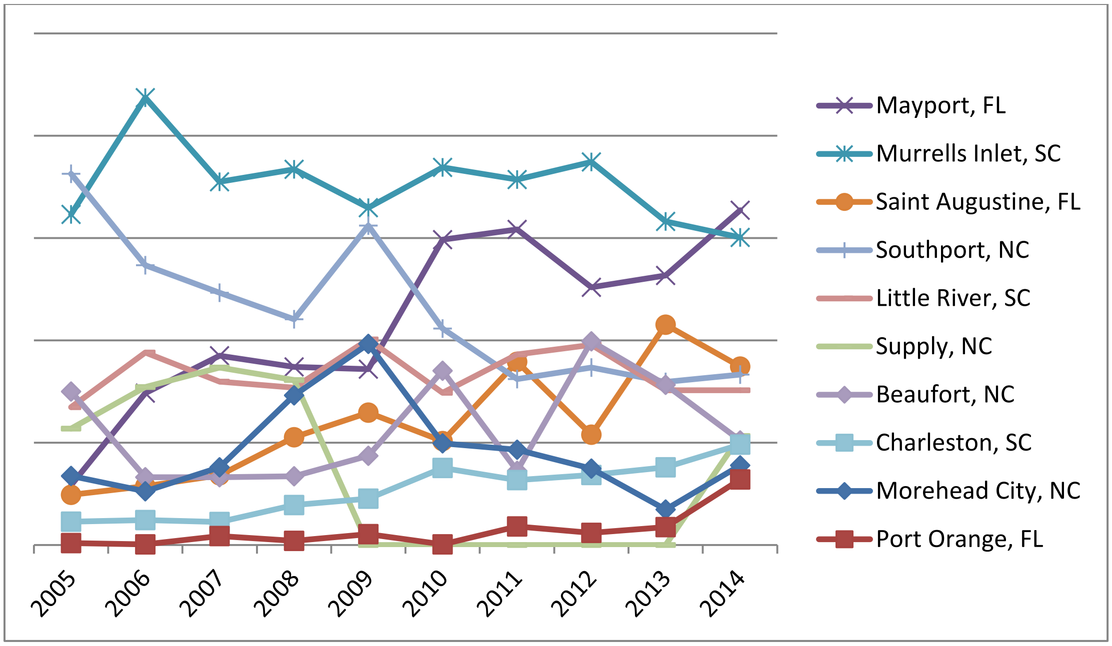

Figure.3.4.6. Red porgy community RQ for pounds from 2005 to 2014 ranked initially by 2014 top ten. Source: NMFS SERO ALS Database (with dealer address) (2017).

Vermilion Snapper

In terms of vermilion snapper RQ there seems to be considerable fluctuations among the top ten communities (**Figure 3.4.7**). Mayport, FL ranks highest in 2014 but was well into the middle of the group in 2005. Other communities, like Murrells Inlet and Little River, SC seem to rank high in early years but drop down and then regain their rankings and drop again in the most recent years. Supply, NC ranks in the top 5 and then drops to zero with some landings appearing in 2014.

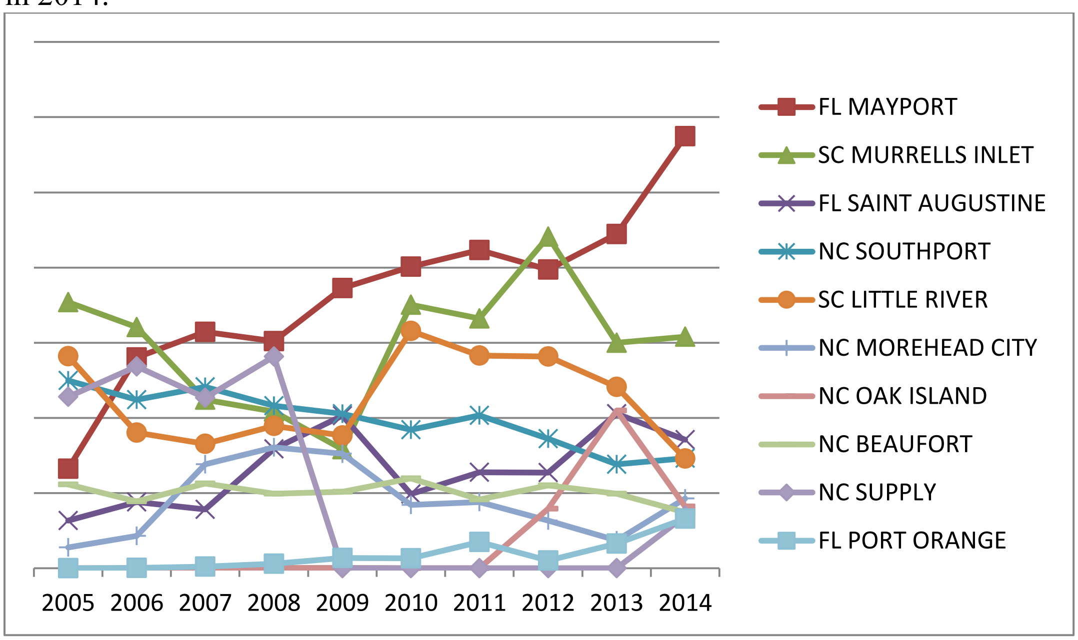

Figure.3.4.7. Vermilion snapper community RQ for pounds from 2005 to 2014 ranked initially by 2014 top ten.
Source: NMFS SERO ALS Database (with dealer address) (2017).

Other Jacks Complex

The harvest of Other Jack species (lesser amberjack, banded rudderfish, almaco jack) in **Figure 3.4.8** shows a rather stable trend for community RQ in the early years, but after 2009 there seems to be large fluctuations for some communities. The community of Palm Beach shows a significant increase in its pounds RQ for other jacks in 2010 and just as significant decline afterward with a mild recovery to rank just below Islamorada, FL in 2014. Murrells Inlet, SC saw a sharp increase in 2012 but has since dropped well below the other communities in 2014.

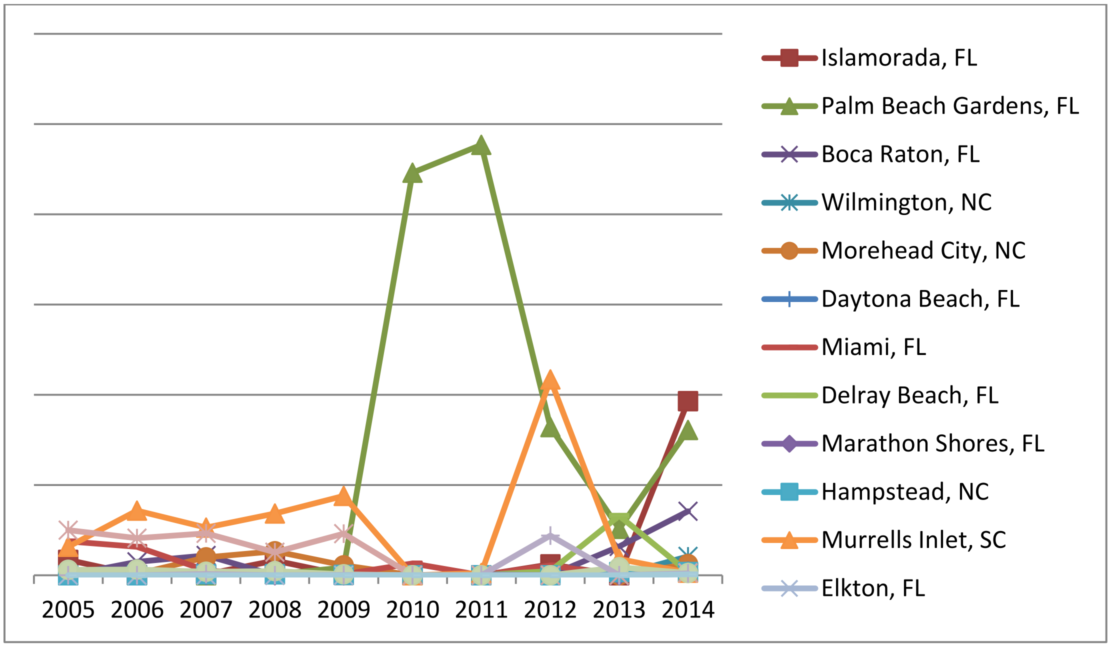

Figure.3.4.8. Other jack community RQ for pounds from 2005 to 2014 ranked initially by 2014 top ten. Source: NMFS SERO ALS Database (with dealer address) (2017).

Red Grouper

While most communities have demonstrated a fairly stable trend in their RQ for red grouper in **Figure 3.4.9**, Key West, FL has seen a rather steady decline in its landings of those species after 2005 and then an increase in its RQ after 2010. Southport, NC is ranked second and was ranked higher in 2009 through 2010 but has fallen in recent years. Most other communities have seen a rather consistent RQ ranking through the time series.

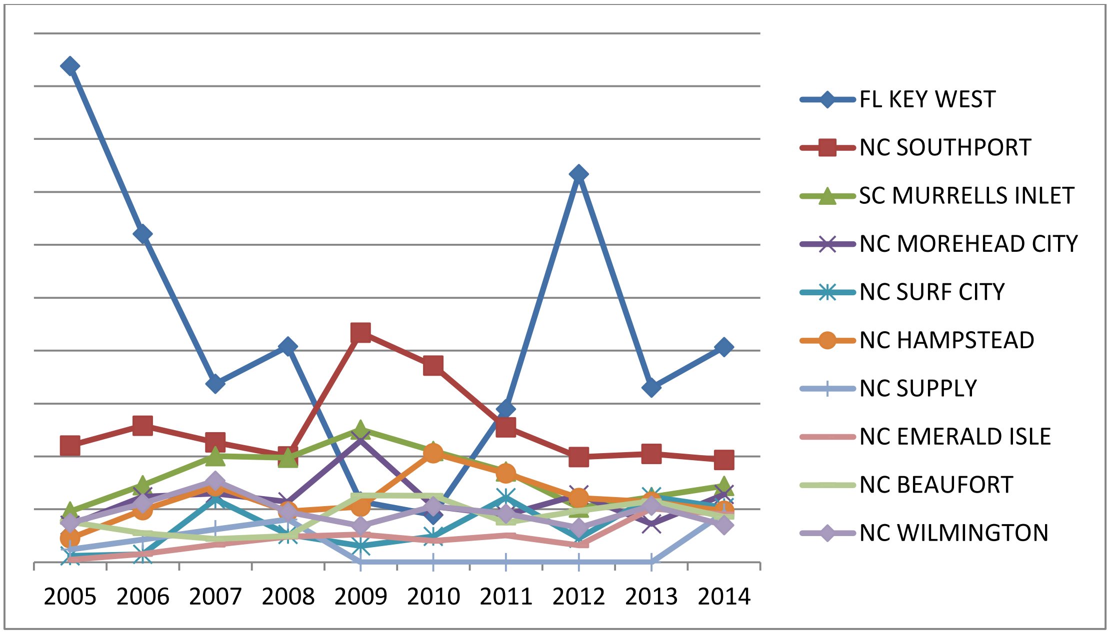

Figure.3.4.9. Red grouper community RQ for pounds from 2005 to 2014 ranked initially by 2014 top ten. Source: NMFS SERO ALS Database (with dealer address) (2017).

Deep-water Snappers

The community of Key West, FL has remained the top community in terms of harvest for the selected **deep-water species** (queen snapper, silk snapper, and blackfin snapper) in **Figure 3.4.10.** Over time, there have been rather steady declines and sharp increases however. Miami, FL did see a spike in its RQ for the selected deep water species in 2010, but has since dropped in its ranking, although still second, well below Key West. The other communities involved have rather stable involvement, but well below the top community of Key West.

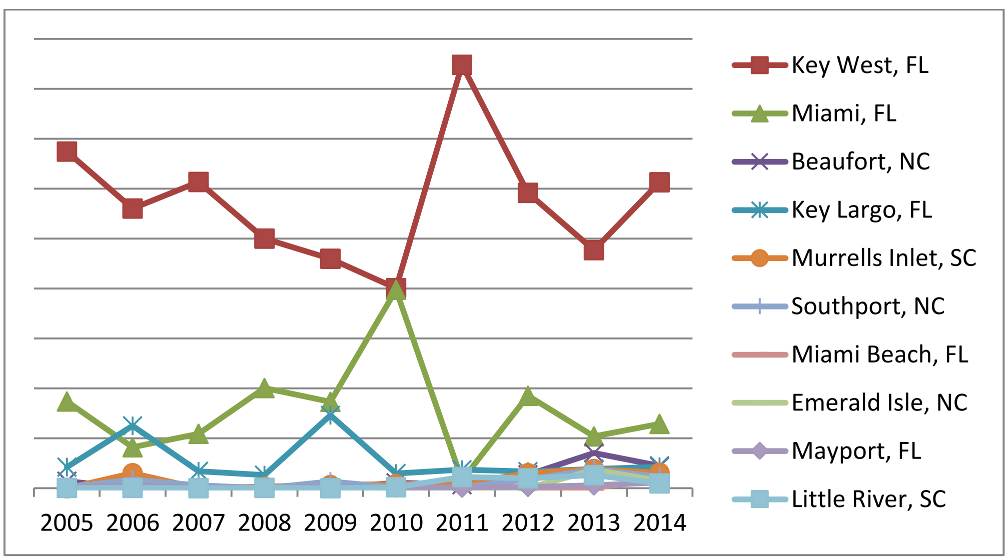

Figure.3.4.10. Selected deep-water species community RQ for pounds from 2005 to 2014 ranked initially by 2014 top ten.
Source: NMFS SERO ALS Database (with dealer address) (2017).

Gray triggerfish

In terms of **gray triggerfish** RQ there again seems to be considerable fluctuations among the top ten communities (**Figure 3.4.11**). Mayport, FL ranks highest in 2014 but was well into the middle of the group in 2005 for this species also. Other communities, like Murrells Inlet and Little River, SC seem to rank high in early years but drop down and then regain their rankings and drop again in the most recent years. Oak Island, NC has no landings in the early years, but ranks in the top 5 in 2014. Other communities have substantial fluctuations throughout the time period.

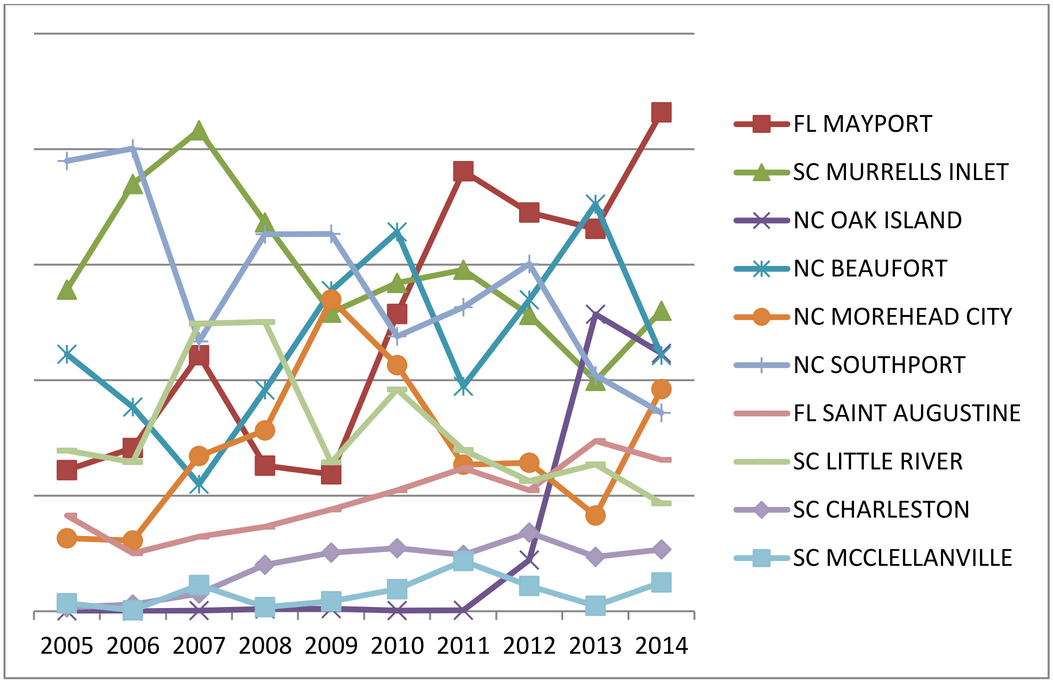

Figure.3.4.11. Gray triggerfish community RQ for pounds from 2005 to 2014 ranked initially by 2014 top ten.
Source: NMFS SERO ALS Database (with dealer address) (2017).

Commercial Fishing Engagement

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

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

Using a principal component and single solution factor analysis each community receives a factor score for each index to compare to other communities. Factor scores are represented by colored bars and are standardized, therefore the mean is zero. Two thresholds of 1 and ½ standard deviation above the mean are plotted onto the graphs to help determine thresholds for significance. Because the factor scores are standardized, a score above 1 is also above one standard deviation. The top 20 communities in **Figure 3.4.12** are all above the threshold of one standard deviation and therefore commercial fishing is likely to have a large impact on the local economy.

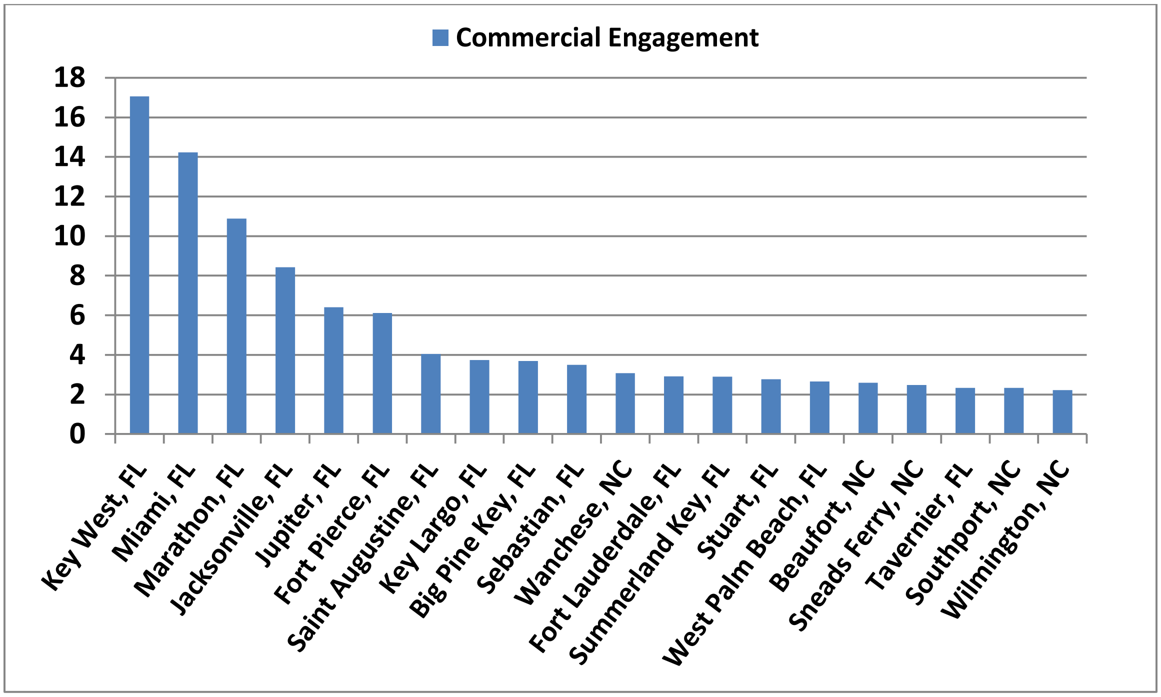

Figure.3.4.12. Top 20 commercial fishing communities as measured by overall commercial fishing engagement.
Source: NMFS SERO Community Social Vulnerability Indicators Database (2017).

Environmental Justice

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

In order to assess whether a community may be experiencing EJ issues, a suite of indices created to examine the social vulnerability of coastal communities (Colburn and Jepson 2012; Jacob et al. 2012) is presented in **Figures 3.4.13 - 3.4.15** for those communities that appear in **Figure 3.4.3 - Figure 3.4.12**. The three indices are poverty, population composition, and personal disruptions. The variables included in each of these indices have been identified as important components that contribute to a community's vulnerability. Indicators such as increased poverty rates for different groups, more single female-headed households and children under the age of 5, disruptions such as higher separation rates, higher crime rates, and unemployment all are signs of vulnerable populations. These indicators are closely aligned to previously used measures of EJ which used thresholds for the number of minorities and those in poverty. For those communities that exceed the threshold, it is expected that they would exhibit vulnerabilities to sudden changes or social disruption that might accrue from regulatory change.

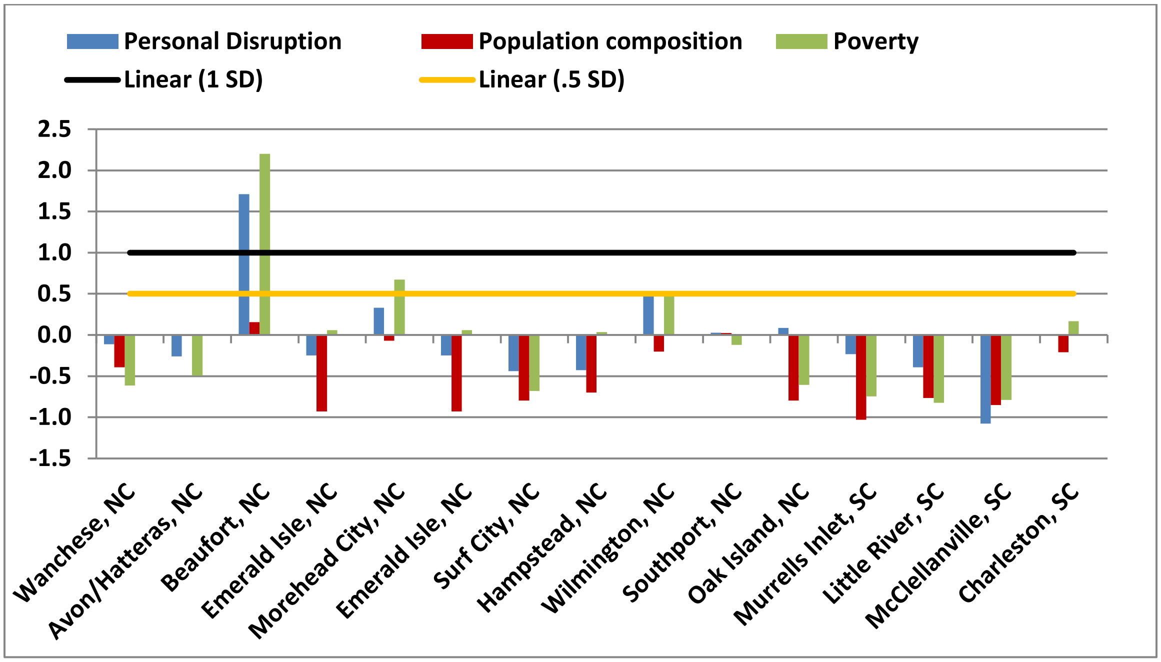

Figure.3.4.13. Social vulnerability indicators for selected NC/SC snapper grouper fishing communities. Source: NMFS SERO Community Social Vulnerability Indicators Database (2017).

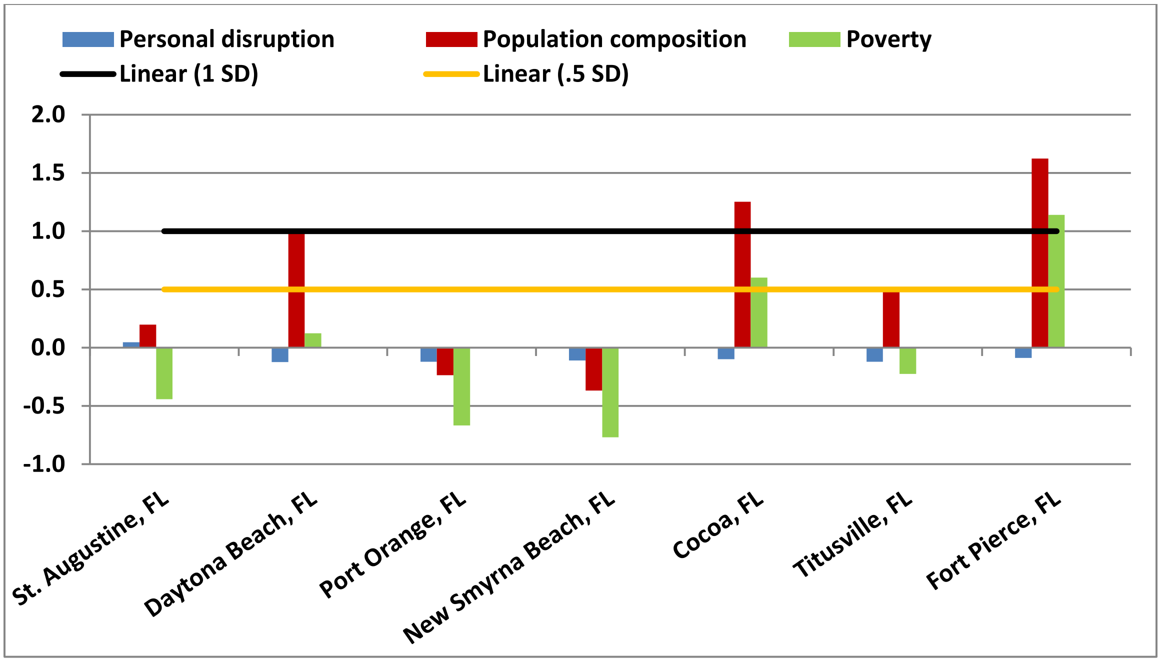

Figure.3.4.14. Social vulnerability indicators for selected Northern Florida snapper grouper fishing communities.
Source: NMFS SERO Community Social Vulnerability Indicators Database (2017).

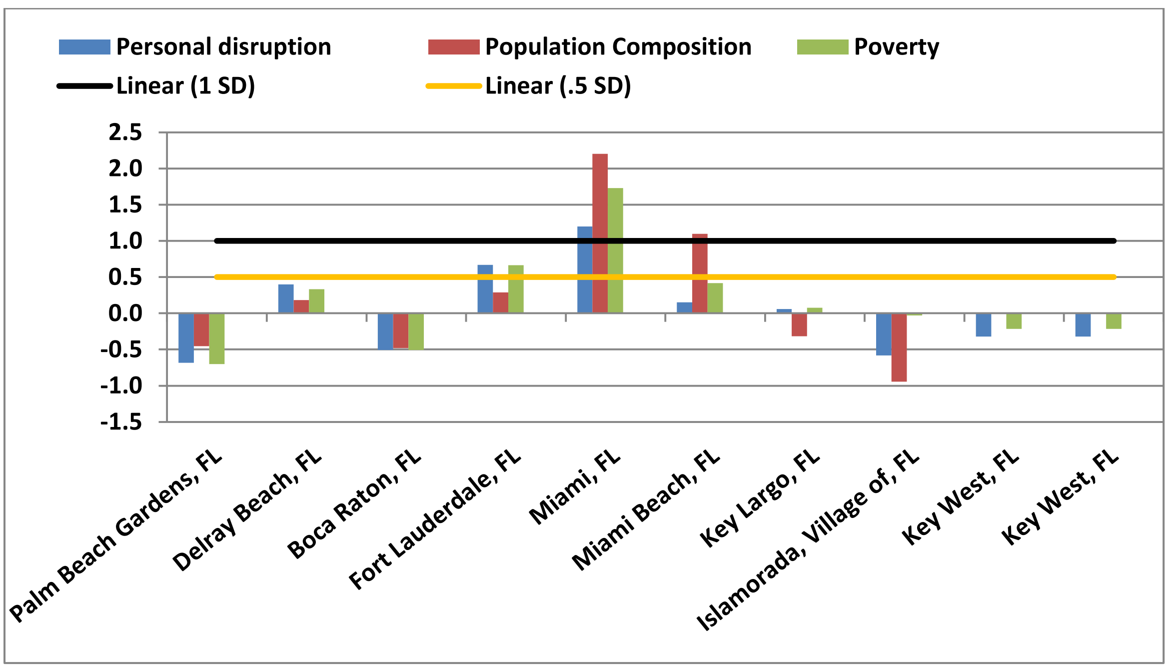

Figure.3.4.15. Social vulnerability indicators for selected Southern Florida snapper grouper fishing communities.
Source: NMFS SERO Community Social Vulnerability Indicators Database (2017).

3.5 Administrative Environment

3.5.1 The Fishery Management Process and Applicable Laws

3.5.1.1 Federal Fishery Management

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

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

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

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

3.5.1.2 State Fishery Management

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

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

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

3.5.1.3 Enforcement

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

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

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

The NOAA Office of General Counsel Penalty Policy and Penalty Schedule is available online at http://www.gc.noaa.gov/enforce-office3.html.

Chapter 4. Environmental Effects and Comparison of Alternatives

Note: Language of actions/alternatives to be updated based on Council action in June

A Note on Analytical Methods

Two projection models were developed to predict the effects of proposed alternatives on future commercial landings: (1) based on the last three years of data (2014-2016; "Last 3"), and (2) a seasonal auto-regressive integrated moving average (SARIMA) model fit to landings data from 1997-2016. The Last 3 approach is a simple average and highly sensitive to recent trends. The SARIMA model, as selected by AIC and other factors, represents the best statistical fit to the time-series data, accounting for any seasonal and/or interannual trends. The SARIMA model approach is sensitive to recent trends, captures long term trends, better expresses uncertainty, and has been shown to provide superior fits to catch trends as compared to recent year's data approaches (Farmer & Froeschke 2015).

When the Last 3 and SARIMA approaches provide very different mean estimates of catch rates and closure dates, this should be interpreted as an indication that historical data are not very informative of future trends. When different modeling approaches provide reasonably close estimates of catch rates and closure dates but confidence limits are wide, this should be interpreted as high variability within the historical data. Both modeling approaches were retained for projections in **Appendix J** to provide the Council information regarding the uncertainty in the projected closure dates. Most of the species under consideration are indirectly harvested during trips targeting other stocks; for this reason, uncertainty in the historical data is often high. Similarly, actions involving targeted species often require extrapolation of catch rates to periods that have been subject to recent closures or a complex management history, further contributing to uncertainty.

A more detailed explanation of these methods, caveats, assumptions, and results of projections can be found in **Appendix J**. Because both models were constructed with a terminal year of 2016, the recently available 2017 data are used, when possible, to inform decision-making with regards to the best predictive model using a retrospective comparison of model predictions to 2017 data.

4.1 Action 1. Establish a commercial split season and modify the commercial trip limit for blueline tilefish

4.1.1 Biological Effects

Blueline tilefish management has been very dynamic over the past few years, with many regulatory changes including a prohibition of harvest beyond the 240 fathoms depth contour in 2011 (Amendment 17B, SAFMC 2010b; **Table 4.1.1.1**). The input data available for forecasting future landings have consequently been affected, which has implications for the reliability of analyses. In general, the most recent year is probably the best available predictor of future trends. **Figure 4.1.1.1** presents the distribution of commercial blueline tilefish landings by state from 2004 through 2013 (excluding 2014-2016 due to closures; see **Table S-3** in **Appendix J**). **Figure 4.1.1.2** presents the percentage of blueline tilefish landings by state in the South Atlantic region from 2002 through 2016 (see **Table S-4** in **Appendix J**). North Carolina dominated blueline tilefish commercial landings until recently.

Alternatives*

1. (No Action). The commercial fishing year for blueline tilefish is the calendar year. The trip limit is 300 pounds gutted weight (gw).

2. Specify two 6-month commercial fishing seasons: allocate 40% of the commercial ACL to the first season and 60% to the second season. Allow quota roll-over between seasons
   - 2a. Season 1 trip limit = 100 pounds gw; Season 2 trip limit = 300 pounds gw.
   - 2b. Season 1 trip limit = 150 pounds gw; Season 2 trip limit = 300 pounds gw.

3. Do not implement split seasons but modify the commercial trip limit:
   - **3a. 100 pounds gw from 1/1 through 4/30 and 300 pounds gw from 5/1 through 12/31.**
   - 3b. 150 pounds gw from 1/1 through 4/30 and 300 pounds gw from 5/1 through 12/31.
   - 3c. 100 pounds gw from 1/1 through 6/30 and 300 pounds gw from 7/1 through 12/31.

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

Table 4.1.1.1. Blueline tilefish total commercial landings in pounds whole weight (lbs ww) and closure dates, 2012-2017.

Fishing Year	Landings	ACL	%ACL	Closure Date
2017	86,507	87,521	98.84	7/18/17; Reopened 10/24/17-11/1/17
2016	97,798	87,521	111.74	6/1/16; reopened 7/13/16, closed 8/30/16
2015	78,303	17,841	438.89	4/7/2015
2014	156,371	112,207	139.36	6/23/2014

Source: SERO ACL Monitoring Webpage [accessed 2/6/2018].

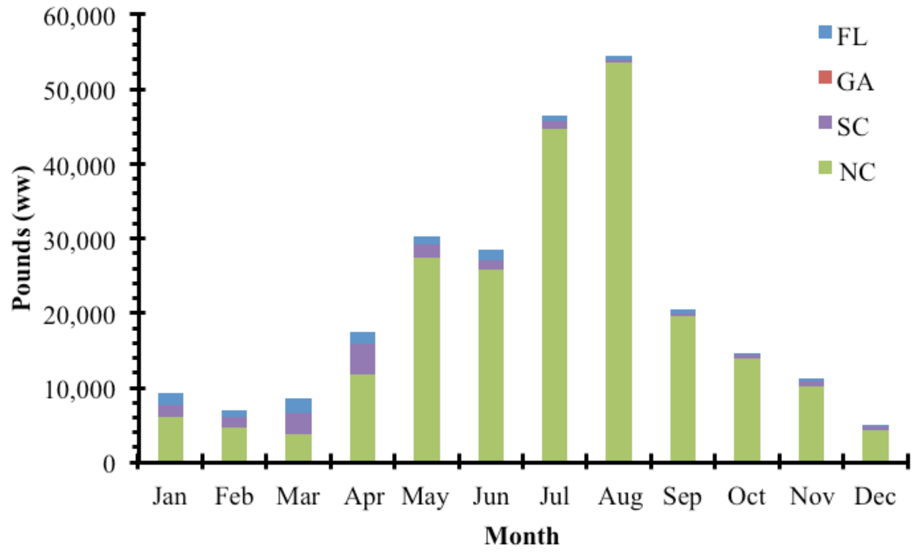

Figure 4.1.1.1. The average monthly South Atlantic blueline tilefish commercial landings by state from 2004-2013 (lbs ww). The years 2014-2016 were excluded due to closures.
Source: SERO with data from Southeast Fisheries Science Center commercial (5/2/2017) ACL dataset.

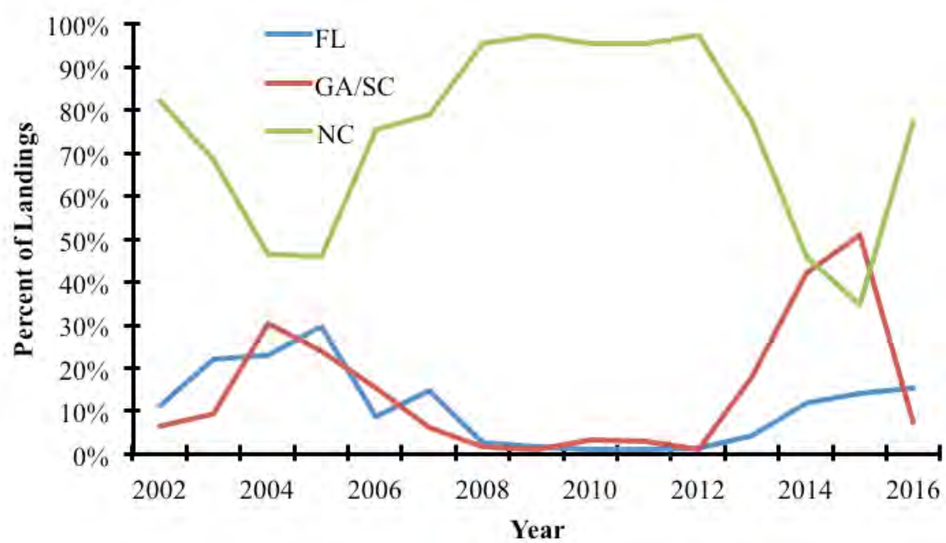

Figure 4.1.1.2. The percentage of annual South Atlantic blueline tilefish commercial landings by state from 2002-2016 (lbs ww). Georgia and South Carolina were combined due to confidentiality concerns.
Source: SERO with data from Southeast Fisheries Science Center commercial (5/2/2017) ACL dataset.

Discussion of potential effects of this action and subsequent actions in this amendment will use results using the "Last 3" projection model.

Due to recent dynamic changes in the fishery and challenges accounting for the imposition of a 300-pound trip limit in July 2016 (Regulatory Amendment 25; SAFMC 2015), there is uncertainty in catch rate projections for blueline tilefish. Trip limit impacts were simulated by modifying and re-summarizing landings from commercial logbook trip records (SEFSC commercial logbook data, accessed April 2017). Refer to **Appendix J** for detailed methodology.

Projected season lengths under **Alternative 1 (No Action)** through **Preferred Alternative 3** are provided in **Table 4.1.1.2**. Under **Alternative 1 (No Action**) (no split season and 300-pound trip limit), commercial landings of blueline tilefish are expected to reach the ACL during early July. Splitting the commercial ACL with a 40/60 allocation into two seasons, as proposed under **Alternative 2**, and imposing a trip limit of 100 pounds (**Sub-alternative 2a**) or 150 pounds (**Sub-alternative 2b**) during the first season, would result in the ACL being reached in mid-June or mid-May, respectively. During the second season, under the proposed 300-pound trip limit (**Sub-alternatives 2a** and **2b**), the ACL is expected to be reached in early to mid-August (**Table 4.1.1.2**). Under current management, in-season closures occurred in June and July in 2016 and 2017, respectively. Therefore, **Alternative 2** and its sub-alternatives are not expected to have an appreciable effect in lengthening blueline tilefish commercial harvest in the South Atlantic.

Splitting the commercial blueline tilefish ACL into seasons can improve fishermen's access to the resource. As shown in **Figures 4.1.1.1** and **4.1.1.2**, North Carolina has landed the majority of blueline tilefish until regulatory changes in 2014 shifted that trend. Imposing a split season for commercial harvest of blueline tilefish may allow more fishermen throughout the South Atlantic Council's area of jurisdiction to access blueline tilefish. Moreover, because blueline tilefish and snowy grouper are commonly caught together, it is desirable to align the seasons in order to minimize discards. Hence, the adoption of a commercial split season for snowy grouper under Action 2 could reduce blueline tilefish discards.

Preferred Alternative 3 and its sub-alternatives do not consider splitting the commercial blueline tilefish ACL into seasons. Instead the alternatives propose varying trip limits during certain times of the year. According to projections (**Table 4.1.1.2)**, **Sub-alternative 3c** would result in the longest open season with a projected closure date at the beginning of August, whereas both **Preferred Sub-alternative 3a** and **Sub-alternative 3b** would result in the shortest season with a likely closure at the end of July. The biological effects of **Alternative 2** and **Preferred Alternative 3** relative to **Alternative 1 (No Action)** would be neutral as overall harvest would be limited to the ACL and split-season quotas, and accountability measures would be triggered if the ACL or seasonal quotas were exceeded. However, biological benefits may be realized if discards of blueline tilefish diminish as a result of compatible management of snowy grouper under Action 2 of this amendment.

Table 4.1.1.2. Projected mean and 95% lower and upper (L95, U95) confidence limits quota closure dates for blueline tilefish under different alternatives and sub-alternatives proposed for Action 1 using the "Last 3" projection model (**Appendix J**). Blanks denote no projected quota closure. Preferred alternative indicated in bold.

Alternative	Season	L95	MEAN	U95
1: No Action	Jan-Dec		7-Jul	22-Apr
2a: 40% of ACL; 100 pounds	Jan-June		12-Jun	28-Mar
60% of ACL; 300 pounds	July-Dec		11-Aug	27-Jul
2b: 40% of ACL; 150 pounds	Jan-June		14-May	20-Mar
60% of ACL; 300 pounds	July-Dec		11-Aug	27-Jul
3a: 100 pounds Jan-Apr; 300 pounds May-Dec	Jan-Dec		**30-Jul**	16-Jun
3b: 150 pounds Jan-Apr; 300 pounds May-Dec	Jan-Dec		24-Jul	4-Jun
3c: 100 pounds Jan-Jun; 300 pounds July-Dec	Jan-Dec		8-Aug	6-Jul

Mean monthly estimates of commercial discards for the affected species in this amendment, including blueline tilefish, from the SEFSC Supplemental Commercial Discard Logbook (accessed May 2017) are provided in **Table 4.1.1.3**. From 2014-through 2016, discards of blueline tilefish peaked in April followed by August and September.

Blueline tilefish have a lengthy spawning season with highest activity from April through September (**Table 3.2.1**). **Alternative 2** and **Preferred Alternative 3** would also allow commercial harvest of blueline tilefish to continue during the spawning season thus precluding biological benefits over **Alternative 1 (No Action)**.

Table 4.1.1.3. Mean monthly estimates of discards (numbers of fish) from all South Atlantic commercial trips (2014-2016) based on self-reported discard rates (SEFSC Supplemental Discard Logbook, accessed May 2017) expanded to overall South Atlantic commercial fishing effort (SEFSC Commercial Logbook, accessed May 2017), aggregated across all gears.
Note that SEDAR has found this approach consistently underestimates discarded fish relative to observer data in the Gulf of Mexico.

Month	Blueline Tilefish	Red Porgy	Snowy Grouper	Greater Amberjack	Vermilion Snapper	Jacks	SWG	DWS	Gray Triggerfish
Jan	0.00	2,784.62	21.79	126.52	112.93	14.60	361.09	0.00	5.33
Feb	2.38	2,950.04	9.69	100.28	10.54	9.20	404.17	0.00	97.35
Mar	2.04	2,732.02	31.40	105.94	68.95	4.93	557.48	0.61	6.12
Apr	1,558.58	1,405.03	17.00	31.43	67.77	0.54	368.23	0.00	87.54
May	456.90	599.67	61.73	467.96	581.99	32.44	1,335.87	0.00	301.74
Jun	276.24	287.47	87.23	521.50	325.87	99.53	579.78	0.00	119.99
Jul	11.35	364.42	50.90	258.53	643.80	254.69	971.22	0.00	492.58
Aug	805.09	636.27	19.76	233.53	176.77	582.11	901.70	0.00	722.74
Sep	1,146.26	202.66	13.41	168.20	229.39	439.25	1,088.71	0.00	526.26
Oct	0.00	43.29	1.70	223.60	617.30	587.64	1,224.53	0.00	49.79
Nov	0.00	14.12	22.80	24.84	1,356.20	65.21	1,360.18	0.00	141.87
Dec	0.00	39.50	1.57	31.26	904.97	152.30	615.67	0.00	106.90

SWG: Shallow-water grouper (gag, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, graysby, and coney)
DWS: Deep-water snapper (blackfin, queen, silk snapper)

4.1.2 Economic Effects

Alternative 1 (No Action) would maintain the current commercial fishing season for blueline tilefish, which is the calendar year. It would also maintain the current 300 pounds (lbs) gutted weight (gw) trip limit. Under this alternative, it is estimated that full ACL would be harvested by early July, or sooner if catch rates are higher than predicted (Appendix J, Table 3). This would reduce the portfolio of species available for commercial harvest later in the year, which could result in forgone economic benefits for vessels that actively fish during that time period. Estimated closure dates were generated using two separate modeling approaches as described in **Appendix J**, (1) based on the last three years of landings data (2014-2016; "Last 3"), and (2) a seasonal auto-regressive integrated moving average (SARIMA) time series model. The results of each of these models diverge by as much as a few weeks and therefore may result in different estimated changes in ex-vessel revenue. As such, quantitative estimates of season length and economic effects will not be provided until one of the models is deemed to be the best scientific information available by the Council's Scientific and Statistical Committee (SSC).

Alternative 2 would establish a commercial split season for blueline tilefish and simultaneously reduce the commercial trip limit for the first season. Under **Alternative 2**, 60% of the ACL would be allocated to the second half of the year and the commercial trip limit from January 1 through June 30 would be reduced to either 100 lbs gw (**Sub-alternative 2a**) or 150 lbs gw (**Sub-alternative 2b**). These changes would be expected to increase the amount of landings that occur in the second half of the year, but would also reduce the amount of landings and available fishing days that occur in the first half of the year relative to the status quo (**Alternative 1**). These sub-alternatives would affect trip-level landings of blueline tilefish during the first half of the year, as well. **Sub-alternative 2a** would be the most restrictive in terms of the commercial trip limit during the first season, but would also be expected to result in a longer first season than **Sub-alternative 2b**. In aggregate, the expected annual landings and ex-vessel revenue derived from blueline tilefish would likely be similar under each of the alternatives, because the full ACL is expected to be achieved under each of the alternatives. However, seasonal differences in prices could result in some small differences in aggregate annual ex-vessel revenue estimates. Again, until a particular forecast model is selected by the SSC, season length and economic effects will not be quantified.

The economic effects on individual harvesters from **Sub-alternative 2a** and **Sub-alternative 2b** would depend on each harvester's profit maximization strategy, their dependence on blueline tilefish, their seasonal fishing behavior, and their ability to adapt to the changing regulations. Some harvesters may benefit from a redistribution of blueline tilefish fishing days, while others may be hindered by a lower trip limit and ACL during the first half of the year. Lower trip limits can reduce profits through a reduction in harvesting efficiency. Higher trip-level revenues later in the year as a result of a longer season could, however, offset the negative effects experienced earlier in the year. These types of individual effects cannot be quantified with available data.

Preferred Alternative 3 would not modify the commercial blueline tilefish season but would reduce the commercial trip limit during the first part of the fishing year**. Preferred sub-alternative 3a** and **Sub-alternative 3b** would set trip limits of 100 lbs gw and 150 lbs gw, respectively, from January 1 through April 30, after which the trip limit would revert back to the current trip limit of 300 lbs gw for the remainder of the year. **Sub-alternative 3c** would set a trip limit of 100 lbs gw from January 1 through June 30, with a trip limit of 300 lbs gw from July 1 through December 31. The models described in **Appendix J** estimate that **Sub-alternative 3c** would provide the longest fishing season, followed by **Preferred Sub-alternative 3a** and **Sub-alternative 3b** (**Appendix J Table 3**). It is expected that the full commercial ACL would be harvested under each of these alternatives and therefore aggregate annual ex-vessel revenue estimates would be similar. Due to differences in estimated closure dates across forecast models, no quantitative estimates of season length or economic effects will be provided at this time, nor will a comparison of economic effects be made between **Alternative 2** and **Preferred Alternative 3**. As stated earlier, individual harvesters may experience positive or negative economic effects from these alternatives relative to the status quo, as reduced trip limits and longer seasons may have varying effects on harvesters depending on a variety of factors already discussed under **Alternative 2**.

Because the overall level of harvest is not expected to change under **Action 1**, the impacts on the blueline tilefish stock are expected to be minimal under each of the alternatives. However, unforeseen changes in discards or spawning levels due to temporal changes in fishing pressure could challenge this assumption and result in future reductions in allowable harvest levels and associated ex-vessel revenue in the long-term. Also, shifts in targeting behavior as a result of this action could potentially have negative impacts on other commercially-important stocks. It is assumed that the likelihood of such indirect economic effects would be low.

4.1.3 Social Effects

A description of the communities that would most likely be affected by changes in commercial management of blueline tilefish can be found in **Section 3.4**, and includes: Port Orange, Titusville, Palm Beach Gardens, Cocoa, Miami, Fort Pierce and Key West, Florida; Little River and McClellanville, South Carolina; and Wanchese, Hatteras and Oak Island, North Carolina (**Figure 3.4.2**). These communities would likely be affected by changes to the commercial split season and commercial trip limits for blueline tilefish.

Alternative 2 would establish a commercial split season for blueline tilefish and may help to extend commercial harvest longer than under **Alternative 1 (No Action)**. In general, a split season would be most beneficial for fishermen targeting other species in the beginning of the year, because it would ensure that a portion of the commercial ACL would be available later in the year. Similarly, split seasons under **Alternative 2** would also improve access to the resource providing opportunity for all states in the South Atlantic Council's jurisdiction to harvest blueline tilefish. The proposed split season under **Alternative 2** would align with the season proposed for snowy grouper under **Action 2**. Blueline tilefish and snowy grouper are commonly caught together and establishing a split season has the social benefit of aligning regulations with the way the fishery is conducted. Establishing a split season could result in fishermen shifting effort to or from a certain species (including targets on multi-species trips) based on economic, regulatory, biological, or environmental changes in the fishery resulting from changes in access to the blueline tilefish resource.

For changes in the trip limit under **Sub-alternatives 2a** and **2b**, the potential social effects would depend on how fishermen are affected by either higher trip limits and a shorter season, or lower trip limits and longer seasons. The higher trip limit in the first season under **Sub-alternative 2b** would have the social benefit of increasing trip efficiency, especially for businesses who target multiple species and do not need one species to be open year-round. High trip limits can also result in the ACL being reached faster, triggering an early closure of the first fishing season. Alternatively, businesses focusing primarily on blueline tilefish would benefit from a longer fishing season under **Sub-alternative 2a**. However, trip limits that are too low can decrease trip efficiency, particularly for communities that require longer travel time to fishing grounds.

Because the ACL for blueline tilefish is already low compared to historical landings (**Table 4.1.1.1**), split seasons under **Alternative 2** could generate (or perpetuate) derby conditions. In addition to concerns about safety at sea that arise from the race to fish, a derby could result in a large amount of blueline tilefish on the market in a very short period. This may cause reduced market value and lower product quality, and the bust-and-boom nature of the commercial blueline tilefish sector may hinder business stability and steady job opportunities for captain and crew.

Preferred Alternative 3 would modify the commercial trip limit for blueline tilefish and may help to extend commercial harvest longer than under **Alternative 1 (No Action)**. **Preferred Sub-alternative 3a,** and **Sub-alternative 3b,** and **3c** would implement more restrictive trip limits early in the season. Again, the potential social effects would depend on how fishermen are affected by either higher trip limits and a shorter season, or lower trip limits and longer seasons. **Sub-alternative 3c** would result in the longest season, while **Preferred Sub-alternative 3a** and **Sub-alternative 3b** result in shorter seasons.

Overall, the positive and negative effects on commercial fishermen of establishing a split season under **Alternative 2** or modifying commercial trip limits under **Preferred Alternative 3** will depend on the proportion of the ACL for each season, the length of each season, and the likelihood of commercial harvest being open during times of the year when it is profitable to target blueline tilefish. **Table 4.1.1.2** provides projected quota closure dates under the different alternatives and sub-alternatives. **Alternative 1 (No Action)** would result in the shortest season with a projected closure date of July 7th. **Alternative 2** and its sub-alternatives did not substantially increase the length of the commercial fishing season when compared to **Alternative 1 (No Action)**. **Sub-alternative 3c** would result in the longest season, with a projected closure date of August 8th. Generally, longer fishing seasons provide continued access for commercial fishermen and consistency for end users, if trip limits are sufficient to support commercial fishing activity.

4.1.4 Administrative Effects

Note: Admin effects for all actions to be updated

Alternative 1 (No Action) would not change the administrative environment from its current state. Currently, there is a commercial quota monitoring system in place for blueline tilefish that is utilized to monitor landings against the commercial quota. Since 2012, with 2013 as an exception, commercial harvest has closed early due to landings reaching the ACL prior to the end of the fishing year. If total effort in the fishery remains consistent, it is likely the fishery would reach the ACL prior to the end of the fishing year. Therefore, fishery managers will have to continue to prepare and issue fishery closure notices. Additionally, enforcement personnel would have to monitor the closures. With an in-season quota closure, there is potential that the landings do not reach 100% of the ACL. In that circumstance, guidance from the South Atlantic Council to NMFS recommended that the fishery should reopen if landings are less than 95% of the ACL and the projected number of days that the fishery can reopen to meet the ACL is two or more days. Therefore, NMFS would have to monitor the landings and prepare a reopen notice.

Alternative 2 (including **Sub-alternatives 2a** and **2b**), would allocate the commercial ACL into quotas over two commercial fishing seasons. The season 1 trip limit for **Sub-alternative 2b** is larger than the season 1 trip limit for **Sub-alternative 2a**, so the seasonal quota may be met sooner and would have the potential to be closed early. **Alternative 3** (including **Sub-alternatives 3a-3c**) would not modify the fishing season, but would instead vary the trip limits throughout the fishing year. **Sub-alternative 3b** would have a larger trip limit in the earlier part of the year, compared to **Sub-alternatives 3a-3c**, and the trip limit is increased mid-way through the year, which may lead to the seasonal quota being met faster in the season.

Of the three alternatives considered for management of blueline tilefish, **Alternative 2** would impose the most significant, direct administrative burden. Ongoing monitoring of the seasonal commercial quotas would be required. If the quota for each season is close to being met or exceeded, NMFS would have to prepare and issue fishery closure notices twice as often as they would be required under **Alternative 1 (No Action)**. Additionally, enforcement personnel would be burdened with an increase in potential fishery closures, which they would have to monitor. Outreach materials would take the form of fishery bulletins and updates to NOAA Fisheries Service Southeast Region's web site. As with **Alternative 1 (No Action),** if harvest is closed prematurely, there is twice the potential under **Alternative 2** that the fishery would need to be reopened so that landings could reach the ACL.

4.2 Action 2. Establish a commercial split season for snowy grouper

4.2.1 Biological Effects

Figure 4.2.1.1 presents average monthly landings of snowy grouper by state from 2002 through 2016 (see **Table S-5** in **Appendix J**). The years 2006 and 2012-2016 were excluded due to closures. High snowy grouper landings have generally occurred in North Carolina during the spring whereas Florida sees higher landings in the fall. **Figure 4.2.1.2** presents the percentage of snowy grouper landings by state for the same time period (see **Table S-6** in **Appendix J**). According to these data, North Carolina and Florida landed about the same percentage of snowy grouper in 2016. To further inform the distribution of commercial landings, **Figure 4.2.1.3** presents the number of vessels reporting landings of snowy grouper by state and year from 2006 through 2016. More vessels homeported in Florida have reported landings of snowy grouper in recent years. Note this analysis was performed at the state level, so vessels landing in multiple states would be counted for each state.

> ***Alternatives****
>
> 1 (No Action). The commercial fishing year for snowy grouper is from January 1 to December 31.
>
> 2. Specify two 6-month commercial fishing seasons: allocate 60% of the commercial ACL to the first season and 40% to the second season. Allow quota roll-over between seasons.
>
> **3. Specify two 6-month commercial fishing seasons: allocate 70% of the commercial ACL to the first season and 30% to the second season. Allow quota roll-over between seasons.**
>
> * Preferred indicated in bold. Refer to Chapter 2 for detailed language of alternatives

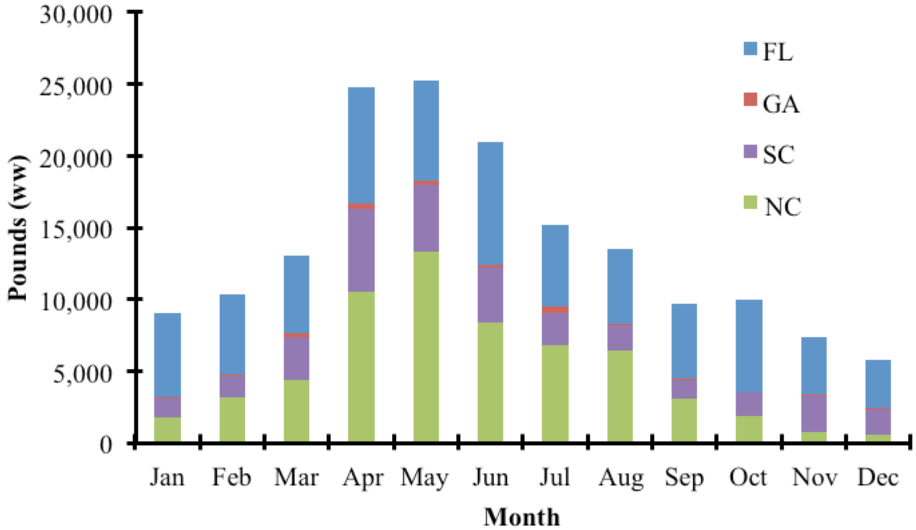

Figure 4.2.1.1. The average monthly commercial South Atlantic snowy grouper landings by state from 2002-2005 and 2007-2011 (lbs ww). The years 2006 and 2012-2016 were excluded due to closures. Source: SERO with data from Southeast Fisheries Science Center commercial (5/2/2017) ACL dataset.

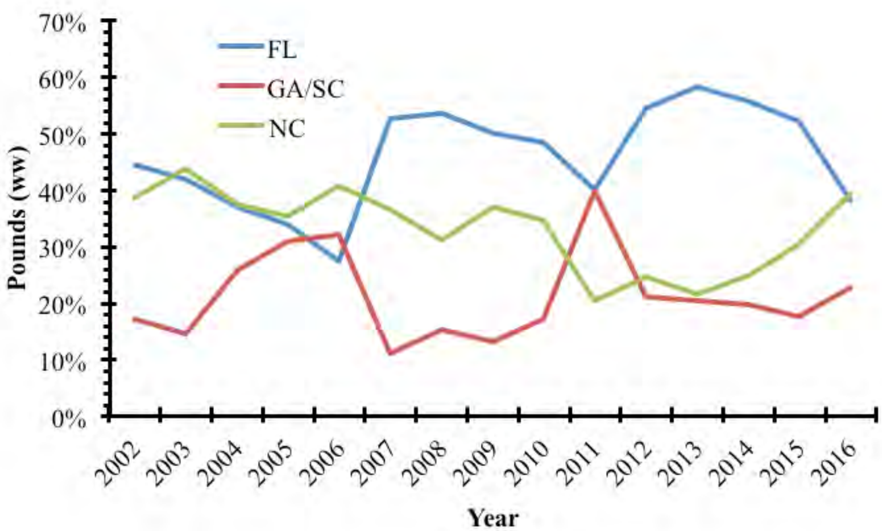

Figure 4.2.1.2. The percentage of annual South Atlantic snowy grouper commercial landings by state from 2002-2016 (lbs ww). Georgia and South Carolina were combined due to confidentiality concerns. Source: SERO with data from Southeast Fisheries Science Center commercial (5/2/2017) ACL dataset.

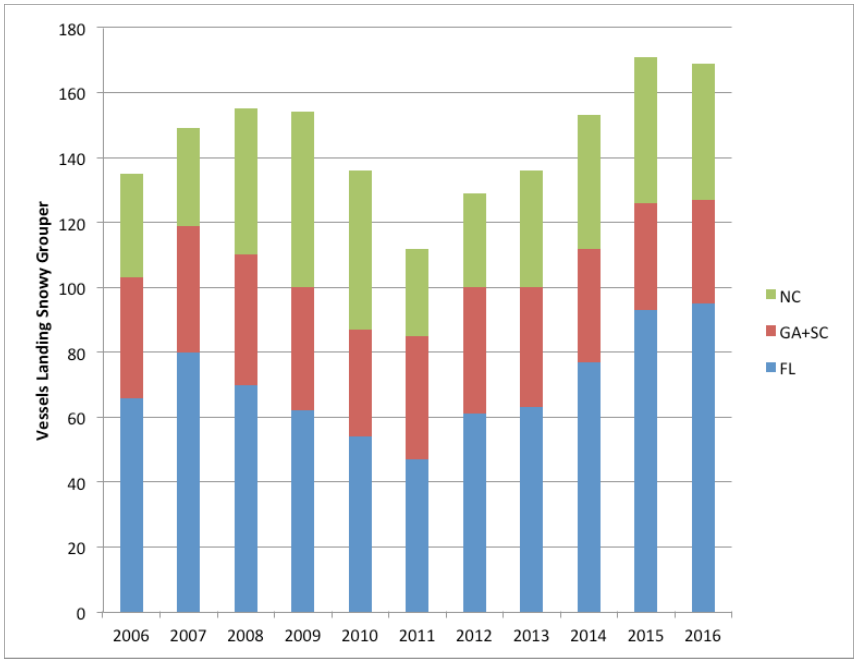

Figure 4.2.1.3. Number of vessels reporting landings of snowy grouper, by state and year. Note that Georgia and South Carolina have been aggregated to protect confidentiality.
Source: SERO

Table 4.2.1.1 shows commercial landings and commercial closures for snowy grouper in the South Atlantic since 2004. In 2016 and 2017, commercial harvest of snowy grouper closed in June. **Table 4.2.1.2** shows predicted closures for commercial snowy grouper harvest based on the "Last 3" projection model (refer to **Appendix J** for details). The numerous changes in trip limits and other regulations for snowy grouper likely make recent data a poor predictor of future trends (see **Appendix C** for a history of management of the snapper grouper fishery); as such, projections are poorly informed. Under **Alternative 1 (No Action)**, the ACL is anticipated to be met by Sept (95% CI: June-No Closure) whereas 50% of the ACL will be achieved by May (95% CI: Apr-Sept) (**Appendix J**). The broad confidence intervals for these predictions and the recent changes in the trip limit indicate high uncertainty in these predictions and they should be interpreted with caution. **Alternative 2** would split the commercial ACL into two 6-month seasons with 60% allocated to the first season and 40% allocated to the second. Under this scenario, the analysis indicates the first seasonal quota would be reached by the end of June whereas the second season would close in late September. If the commercial ACL is apportioned 70/30 between the two seasons, as proposed under **Preferred Alternative 3**, it is expected that there would not be a closure during the first season whereas the second season would close by late September (**Table 4.2.1.2**).

Table 4.2.1.1. Snowy grouper total commercial landings (lbs gw) and closure dates, 2004-2017.

Fishing Year	Landings	ACL		%ACL	Closure
2017	136,561	135,380		100.87	6/22/2017
2016	151,999	125,760		120.86	6/14/2016
2015	131,063	115,451		113.52	9/22/2015
2014	94,491	82,900		113.98	7/25/2014
2013	79,695	82,900		96.13	8/10/2013
2012	89,143	82,900		107.53	12/19/2012
2011	37,461	82,900		45.19	
2010	86,692	82,900		104.57	
2009	75,614	82,900		91.21	
2008	72,971	84,000		86.87	
2007	112,385	118,000		95.24	
2006	214,064	151,000		141.76	10/23/2006
2005	206,636	344,508		59.98	
2004	220,958	344,508		64.14	

Source: SERO ACL Monitoring Webpage [accessed 2/6/2018].

Table 4.2.1.2. Projected mean and 95% lower and upper (L95, U95) confidence limits quota closure dates for snowy grouper under different alternatives proposed for Action 2 using the "Last 3" projection model (**Appendix J**). Blanks denote no projected quota closure. Preferred alternative indicated in bold.

Alternative	Season	L95	MEAN	U95
1 (No Action)	Jan-Dec		21-Sep	1-Jul
2: 60% of ACL	Jan-June		21-Jun	8-May
40% of ACL	July-Dec		26-Sep	26-Sep
3. 70% of ACL	**Jan-June**			**21-May**
30% of ACL	**July-Dec**		**21-Sep**	**14-Sep**

Mean monthly estimates of commercial discards for the affected species in this amendment, including snowy grouper, from the SEFSC Supplemental Commercial Discard Logbook (accessed May 2017) are provided in **Table 4.1.1.3**. Commercial discards of snowy grouper in 2014 through 2016 appears to have been comparatively low to other species in the snapper grouper complex with a peak in May-June. The biological effects of **Alternative 2** and **Preferred Alternative 3** relative to **Alternative 1 (No Action)** would be neutral as overall harvest would be limited to the ACL and split-season quotas, and accountability measures would be triggered if the ACL or quotas were exceeded. However, biological benefits may be realized if discards of snowy grouper are reduced as a result of compatible management of blueline tilefish under Action 1 of this amendment.

Table 3.2.1 indicates spawning activity for snowy grouper peaks during summer months (May-August). In recent years, early closures of commercial harvest have reduced fishing pressure on snowy grouper during peak spawning months resulting in positive biological effects. However, if a split season were implemented as proposed under **Alternative 2** and **Preferred**

Alternative 3, commercial harvest of snowy grouper might continue during peak spawning months resulting in negative biological effects.

4.2.2 Economic Effects

Alternative 1 (No Action) would maintain the current commercial fishing season for snowy grouper, which is the calendar year. Estimated closure dates for this and the other alternatives were generated using two separate modeling approaches as described in Appendix J, (1) based on the last three years of landings data (2014-2016; "Last 3"), and (2) a seasonal auto-regressive integrated moving average (SARIMA) time series model. The results of these models diverge by as much as 6 months. As such, quantitative estimates of season length and economic effects will not be provided until one of the models is deemed to be the best scientific information available by the Council's Scientific and Statistical Committee (SSC).

Alternative 2 would establish a commercial split season for snowy grouper and would allocate 60% of the ACL to the first season (January 1 to June 30) and 40% of the ACL to the second season (July 1 to Dec 31). Similarly, **Preferred Alternative 3** would establish a commercial split season, but would allocate 70% of the ACL to the first 6-month season and 30% to the second 6-month season. Under both of these alternatives, any unused quota from the first season would be carried over to the second season. In aggregate, the expected annual landings and ex-vessel revenue derived from snowy grouper would likely be similar under each of the alternatives, because the full ACL is expected to be achieved under each of the alternatives. Small differences in aggregate annual ex-vessel revenue estimates could occur as a result of seasonal price variations.

The economic effects on individual harvesters from **Alternative 2** and **Preferred Alternative 3** would depend on each harvester's profit maximization strategy, their dependence on snowy grouper, their seasonal fishing behavior, and their ability to adapt to the changing regulations. Some harvesters may benefit from a temporal redistribution of snowy grouper landings, while others may not. Due to the significant differences in estimated closure dates across forecast models, no quantitative estimates of season length or economic effects will be provided at this time, nor will a comparison of economic effects be made between **Alternative 2** and **Preferred Alternative 3**.

Because the overall level of harvest is not expected to change under **Action 2**, the impacts on the snowy grouper stock are expected to be minimal under each of the alternatives. However, unforeseen changes in discards or spawning levels due to temporal changes in fishing pressure could challenge this assumption and result in future reductions in allowable harvest levels and associated ex-vessel revenue in the long-term. Also, shifts in targeting behavior as a result of this action could potentially have negative impacts on other commercially-important stocks. It is assumed that the likelihood of such indirect economic effects would be low.

4.2.3 Social Effects

A description of the communities that would most likely be affected by changes in commercial management of snowy grouper can be found in **Section 3.4**. and includes: Key West, Miami, Key Largo, Titusville, and Port Orange, Florida; Little River and Murrells Inlet, South Carolina; and Beaufort, Avon, and Oak Island, North Carolina. These communities would likely be affected by a commercial split season for snowy grouper.

A split season under **Alternative 2** and **Preferred Alternative 3** may help to extend commercial harvest longer than under **Alternative 1 (No Action)**. In general, a split season would be most beneficial for fishermen targeting other species in the beginning of the year, because it would ensure that a portion of the commercial ACL would be available later in the year. Access to snowy grouper later in the year is especially important for communities in Florida which see higher landings of snowy grouper in the fall (**Figure 4.2.1.1**). Creating a split season under **Alternative 2** and **Preferred Alternative 3** would align with the split season proposed for blueline tilefish under **Action 1**. Blueline tilefish and snowy grouper are commonly caught together and establishing a split season has the social benefit of aligning regulations with the way the fishery is conducted. Establishing a split season under **Alternative 2** and **Preferred Alternative 3** could result in fishermen shifting effort to or from a certain species (including targets on multi-species trips) based on economic, regulatory, biological, or environmental changes in the fishery resulting from changes in access to snowy grouper.

Overall, the positive and negative effects on commercial fishermen of establishing a split season under **Alternative 2** and **Preferred Alternative 3** will depend on the proportion of the ACL for each season, the length of each season, and the likelihood of commercial harvest being open during times of the year when it is profitable to target snowy grouper. **Table 4.2.1.2** provides projected quota closure dates under the different alternatives and sub-alternatives. Under **Alternative 1 (No Action), Alternative 2,** and **Preferred Alternative 3** the ACL is projected to be reached by mid-September. Under the split season proposed in **Alternative 2**, there would be a closure during the first season by the end of June. **Alternative 2**, which proposes allocating 40% of the ACL to the second season would benefit fishermen operating in Florida where snowy grouper is harvested throughout the fall. Under the split season proposed in **Preferred Alternative 3** there would be no closure in season one (January through June). **Preferred Alternative 3** allocates 70% of the ACL to the first season which would benefit fishermen operating in North Carolina where snowy grouper is harvested in the spring.

4.2.4 Administrative Effects

Alternative 1 (No Action) would not change the administrative environment from its current state. Currently, there is a commercial quota monitoring system in place for snowy grouper that is utilized to monitor landings against the commercial quota. Since 2012, commercial harvest has closed early due to landings reaching the ACL prior to the end of the fishing year. If total effort in the fishery remains consistent, it is likely the fishery would remain open for a short period of time, and reach the ACL prior to the end of the fishing year. Therefore, NMFS would have to continue to prepare and issue fishery closure notices. Additionally, enforcement personnel would have to continue to monitor the closures. With an in-season quota closure, there is potential that the landings do not reach 100% of the ACL. In that circumstance, guidance from the South Atlantic Council to NMFS recommended that the fishery should reopen if landings are less than 95% of the ACL, and the projected number of days that the fishery can reopen to meet the ACL is two or more days. Therefore, the fishery managers would have to monitor the landings and prepare a reopening notice.

Alternatives 2 and **3**, would allocate the commercial ACL into quotas over two commercial fishing seasons. Of the three alternatives considered for management of snowy grouper, **Alternatives 2** and **3** would impose the most significant, direct administrative burden. Ongoing monitoring of the seasonal commercial quotas would be required. If the quota for each season is close to being met or exceeded twice each year, fishery managers will have to prepare and issue fishery closure notices twice as often as they would be required to do under **Alternative 1 (No Action)**. Additionally, enforcement personnel would be burdened with an increase in potential fishery closures, which they would have to monitor. Outreach materials would take the form of fishery bulletins and possible updates to NOAA Fisheries Service Southeast Region's web site. As with **Alternative 1 (No Action),** if harvest is closed prematurely, there is twice the potential under **Alternatives 2** and **3** that the fishery would need to be reopened so that landings could reach the ACL.

4.3 Action 3. Establish a commercial split season and modify the commercial trip limit for greater amberjack

4.3.1 Biological Effects

Average monthly commercial landings for greater amberjack by state from 2005-2015 are provided in **Figure 4.3.1.1** (see **Table S-7** in **Appendix J**). The percentage of annual greater amberjack landings from each state from 2012-2016 is provided in **Figure 4.3.1.2** (see **Table S-8** in **Appendix J**). State landings of greater amberjack were restricted to the most recent five years of data due to high proportions of unclassified amberjacks prior to 2012. Even after 2012, some unclassified amberjacks (greater amberjack, lesser amberjacks, banded rudderfish, and almaco jack) were present in North Carolina landings. North Carolina's seafood dealers began using species-specific codes for greater amberjack in 2011, but it was not until 2015 that unclassified amberjack was completely removed as an option for all dealers.

The commercial fishing year for greater amberjack is from March 1 through the end of February. In 2016 and 2017, commercial harvest of greater amberjack closed in October (**Table 4.3.1.1**). According to projections using the "Last 3" model (refer to **Appendix J**), under **Alternative 1 (No Action)**, the ACL is anticipated to be met by November (95% CI: Sept-No Closure) whereas 50% of the ACL would be achieved by June (95% CI: May-July).

Alternatives*

1 (No Action). The commercial fishing year is from March 1 to the end of February. Restriction on commercial sale and purchase applies during April each year. The commercial trip limit = 1,200 pounds whole weight (ww).

2. Specify two 6-month commercial fishing seasons. Allocate 50% of the commercial ACL to the first season (Mar 1 - Aug 31) and 50% to the second season (Sept 1 - end of February). Allow quota roll-over between seasons Maintain commercial sale and purchase prohibition during April.

- 2a. Season 1 trip limit = 1,200 pounds ww; Season 2 trip limit = 1,000 pounds ww.
- 2b. Season 1 trip limit = 1,000 pounds ww; Season 2 trip limit = 800 pounds ww.
- **2c. Trip limit = 1,000 pounds ww in both seasons.**
- 2d. Trip limit = 1,000 pounds ww in both seasons with reduction to 500 pounds ww in each season once 75% of the seasonal quota is met or projected to be met. A trip limit reduction would not occur in Season 2 unless 75% of the seasonal quota is met or is projected to be met by January 31.

3. Specify two 6-month commercial fishing seasons. Allocate 60% of the commercial ACL to the first season (Mar 1 - Aug 31) and 40% to the second season (Sept 1 - end of February). Allow quota roll-over between seasons. Maintain commercial sale and purchase prohibition during April.

- 3a. Season 1 trip limit = 1,200 pounds ww; Season 2 trip limit = 1,000 pounds ww.
- 3b. Season 1 trip limit = 1,000 pounds ww; Season 2 trip limit = 800 pounds ww.
- 3c. Trip limit equals 1,000 pounds ww in both seasons.

4. Reduce the greater amberjack commercial trip limit and maintain commercial sale and purchase prohibition during April.

- 4a. 1,000 pounds ww.
- 4b. 800 pounds ww.

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

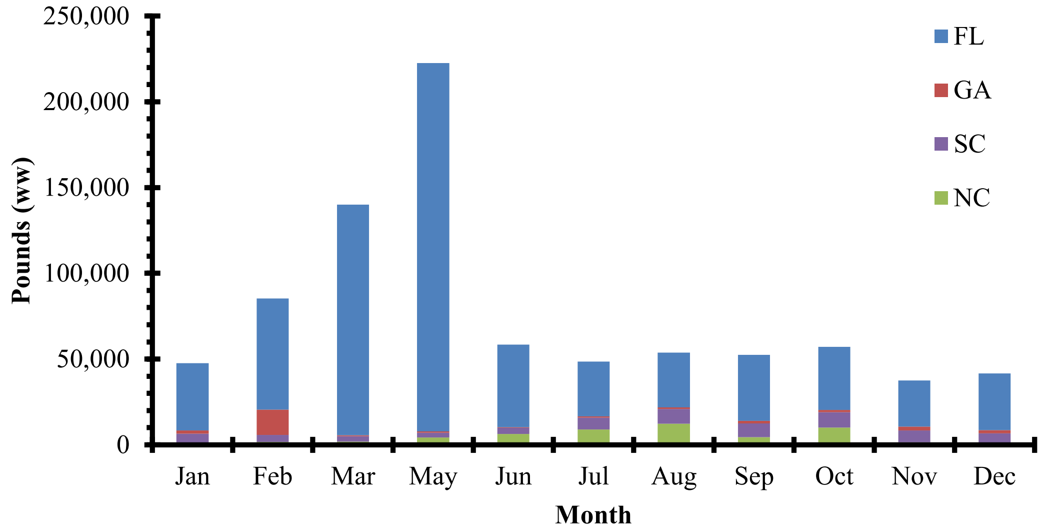

Figure 4.3.1.1. The average monthly South Atlantic greater amberjack landings by state from 2005-2015 (lbs ww). Data from the month of April was not available due to the seasonal closure in place since 1999. The year 2016 was excluded due to a closure.
Source: Southeast Fisheries Science Center commercial (10/5/2017) ACL dataset.

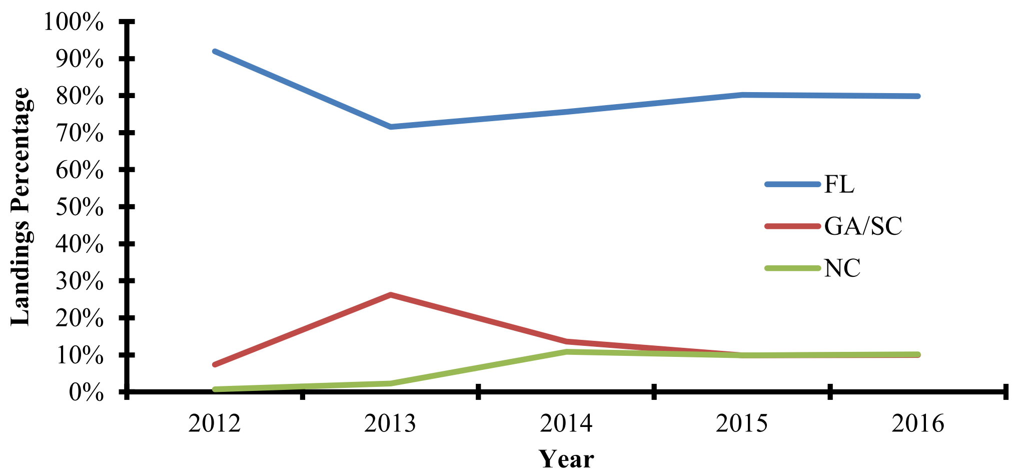

Figure 4.3.1.2. The percentage of annual South Atlantic greater amberjack landings by state from 2012-2016. Georgia and South Carolina were combined due to confidentiality concerns.
Source: Southeast Fisheries Science Center commercial (10/5/2017) ACL dataset. Note: North Carolina's seafood dealers began using a species-specific code for greater amberjack in 2011, but it was not until 2015 that "unclassified amberjacks" was completely removed as an option.

Table 4.3.1.1. Greater amberjack total commercial landings (lbs gw) and closure dates, 2007-2017.

Fishing Year	Landings	ACL		%ACL	Closure Date
March 1, 2017 – February 28, 2018	796,206	769,388		103.5	10/18/2017
March 1, 2016 – February 28, 2017	748,950	769,388		97.34	10/4/2016
March 1, 2015 - Feb 28, 2016	709,130	769,388		92.17	1/21/2016
May 1, 2014 - Feb 28, 2015	754,429	769,388		98.06	
May 1, 2013 - April 30, 2014	882,127	800,163		110.24	
May 1, 2012 - April 30, 2013	972,308	800,163		121.51	
May 1, 2011 - April 30, 2012	1,032,080	1,169,931		88.22	
May 1, 2010 - April 30, 2011	857,839	1,169,931		73.32	
May 1, 2009 - April 30, 2010	837,077	1,169,931		71.55	
May 1, 2008 - April 30, 2009	648,247	1,169,931		55.41	
May 1, 2007 - April 30, 2008	542,438	1,169,931		46.36	

Source: SERO ACL Monitoring Webpage [accessed 2/6/2018].

Table 4.3.1.2 presents estimated closure dates for the various alternatives under this action based on the "Last 3" model (**Appendix J**). **Preferred Alternative 2** proposes a 50/50 split of the commercial ACL between two 6-month seasons with various trip limit sub-alternatives. **Sub-Alternatives 3a** through **3c** propose the same as **Sub-alternatives 2a** through **Preferred Sub-alternative 2c** but under a 60/40 split of the ACL. **Alternative 4** only proposes adjusting the trip limit.

Under **Preferred Alternative 2**, with a 50/50 split of the ACL, **Sub-alternative 2a** (1,200- and 1,000-pound trip limits in Seasons 1 and 2, respectively) would result in the first season closing in mid-June (95% UCL: early June). Both **Sub-alternative 2b** (1,000- and 800-pound trip limits in Seasons 1 and 2, respectively) and **Preferred Sub-alternative 2c** (1,000-pound trip limit in both seasons) would allow the first season to remain open slightly longer than **Sub-Alternative 2a**, to late June (95% UCL: early June). **Sub-alternative 2d** includes a trip limit reduction in the first season and only in the second season if 75% of the commercial ACL has been met or projected to be met by January 31. This sub-alternative would result in the longest season among the **Preferred Alternative 2** sub-alternatives: the first season would close in early July (95% UCL: mid-June). Under **Preferred Alternative 2**, with a 50/50 split of the ACL, the mean and upper 95% confidence limit of Last 3 model predict no closures in the second season.

As presented in **Table 4.3.1.2**, **Sub-alternatives 3a-3c** under **Alternative 3** (60/40 split of the ACL) result in the same predicted closure dates (mid to late June) for the first season as **Sub-**

alternatives 2a through Preferred 2c under **Preferred Alternative 2**, with no closures predicted for the second season (95% UCL: January closure). Under **Alternative 4**, if the greater amberjack commercial trip limit were to be reduced from the current 1,200-pound limit to 1,000 pounds (**Sub-alternative 4a**) and no split season, the commercial ACL could be met by late December (95% UCL: mid-October). Under a 800-pound commercial trip limit (**Sub-alternative 4b**), the ACL might not be met until the end of February, essentially allowing the fishery to remain open for the entire fishing year (95% UCL: early November).

The biological effects of the proposed alternatives and sub-alternatives under this action would not differ from status quo as overall harvest would be limited to the ACL and split-season quotas, and AMs would be triggered if the ACL or quotas were exceeded. Retention of the commercial sale and purchase prohibition during April each year would maintain protection during the peak spawning period (**Table 3.2.1**) thus imparting biological benefit to the greater amberjack stock.

Mean monthly estimates of commercial discards for the affected species in this amendment, including greater amberjack, from the SEFSC Supplemental Commercial Discard Logbook (accessed May 2017) are provided in **Table 4.1.1.3**. From 2014 through 2016 discards of greater amberjack have been highest from May through August, and peaking in June. It is unclear whether the level of discards would be affected if a split season were to be imposed.

Table 4.3.1.2. Projected greater amberjack commercial closure dates under proposed alternatives using the "Last 3" projection model (**Appendix J**). Blanks denote no predicted closure. The sale and purchase prohibition would be maintained during the month of April.

Alternative	Season	L95	MEAN	U95
1: No Action	Mar-Feb		**8-Nov**	30-Sep
Alt 2: Commercial ACL split 50% Season 1 (Mar-Aug) and 50% Season 2 (Sept-Feb)				
2a: 1,200 lbs	Mar-Aug	8-Jul	10-Jun	28-May
1,000 lbs	Sept-Feb			
2b: 1,000 lbs	Mar-Aug	27-Jul	21-Jun	4-Jun
800 lbs	Sept-Feb			
2c: 1,000 lbs	**Mar-Aug**	**27-Jul**	**21-Jun**	**4-Jun**
1,000 lbs	**Sept-Feb**			
2d: 1,000 lbs to 500 lbs once 75% of quota met	Mar-Aug	10-Aug	5-Jul	16-Jun
	Trip limit reduction	8-Jun	26-May	19-May
1,000 lbs to 500 lbs unless 75% of quota met by Jan 31	Sept-Feb			
	Trip limit reduction		21-Feb	1-Jan
Alt 3: Commercial ACL split 60% Season 1 (Mar-Aug) and 40% Season 2 (Sept-Feb)				
3a: 1,200 lbs	Mar-Aug	8-Jul	10-Jun	28-May
1,000 lbs	Sept-Feb			13-Jan
3b: 1,000 lbs	Mar-Aug	27-Jul	21-Jun	4-Jun
800 lbs	Sept-Feb			
3c: 1,000 lbs	Mar-Aug	27-Jul	21-Jun	4-Jun
1,000 lbs	Sept-Feb			12-Jan
Alt 4: No commercial split season				

4a: 1,000 lbs	Mar-Feb		**26-Dec**	14-Oct
4b: 800 lbs	Mar-Feb		**27-Feb**	5-Nov

4.3.2 Economic Effects

Alternative 1 (No Action) would maintain the current commercial fishing season for greater amberjack, which is March 1 through February, with a restriction on commercial sale and purchase during April. It would also maintain the current commercial trip limit of 1,200 pounds (lbs) whole weight (ww). Estimated closure dates for this and the other alternatives were generated using two separate modeling approaches as described in **Appendix J**, (1) based on the last three years of landings data (2014-2016; "Last 3"), and (2) a seasonal auto-regressive integrated moving average (SARIMA) time series model. The results of these models diverge by several months in some cases. As such, quantitative estimates of season length and economic effects will not be provided until one of the models is deemed to be the best scientific information available by the Council's Scientific and Statistical Committee (SSC).

Both **Preferred Alternative 2** and **Alternative 3** would split the current greater amberjack commercial fishing year into two separate seasons, the first one from March 1 through August 31, and the second one from September 1 through February. The restriction on commercial sale and purchase during April would remain as well. **Preferred Alternative 2** would allocate the greater amberjack quota equally between the two seasons; whereas, **Alternative 3** would implement a 60/40 split. Under both of these alternatives, any unused quota from the first season would be carried over to the second season. **Sub-alternatives 2a**, **2b**, and **Preferred Sub-alternative 2c** and **Sub-alternatives 3a-3c** mirror each other and would set commercial trip limits for each season that range from 800 lbs ww to 1,200 lbs ww as described in Section 2.3. **Sub-alternative 2d** would also implement step-down trip limit provisions. There is no comparable sub-alternative with a step-down trip limit under **Alternative 3**. **Alternative 4** would keep the current season but would establish a reduced trip limit of either 1,000 lbs ww (**Sub-alternative 4a**) or 800 lbs ww (**Sub-alternative 4b**).

The economic effects of these alternatives relative to the status quo and to each other would depend on aggregate annual harvest levels and seasonal shifts in landings. Splitting the season may result in open fishing days later in the year that would not have been available under the status quo (**Alternative 1**), but also potential closures earlier in the year (**Appendix J Table 8**). In general, split seasons and lower trip limits may extend the fishing season and increase access later in the year. They may also reduce harvesting efficiency and negatively affect profits. The economic effects on individual harvesters from **Preferred Alternative 2**, **Alternative 3**, **Alternative 4,** and the corresponding sub-alternatives would depend on each harvester's profit maximization strategy, their dependence on greater amberjack, their seasonal fishing behavior, and their ability to adapt to the changing regulations. These types of individual effects cannot be quantified with available data. Estimates of season length and aggregate annual ex-vessel revenue, however, will be provided along with a comparison of each alternative and sub-alternative upon selection of the preferred forecast model.

Indirect economic effects would depend on aggregate harvest levels, changes in seasonal fishing patterns, and potential changes in discard levels. If the greater amberjack stock is negatively impacted by this action, it could result in future reductions in allowable harvest levels and associated ex-vessel revenue in the long-term. To the extent that overall harvest levels are similar across alternatives, these indirect economic effects would be likely be minimal.

4.3.3 Social Effects

A description of the communities that would most likely be affected by changes in commercial management of greater amberjack is included in **Section 3.4** and includes: Key Largo, Mayport, Cocoa, New Smyrna Beach, Islamorada, Port Orange, Sugarloaf Key, Fort Lauderdale, and Saint Augustine, Florida; and Murrells Inlet, South Carolina. These communities would likely be affected by a commercial split season and trip limits modifications for greater amberjack.

A split season under **Preferred Alternative 2** and **Alternative 3** may help to extend commercial harvest of greater amberjack longer than under **Alternative 1 (No Action)**. In general, a split season would be most beneficial for fishermen targeting other species in the beginning of the year, because it would ensure that a portion of the commercial ACL would be available later in the year. **Alternative 3** would provide more of the ACL during the first season (60%) compared to **Preferred Alternative 2** (50%). Establishing a split season could result in fishermen shifting effort to or from a certain species (including targets on multi-species trips) based on economic, regulatory, biological, or environmental changes in the fishery resulting from changes in access to the greater amberjack resource.

For changes in the trip limit under **Sub-alternative 2a, 2b, Preferred Sub-alternative 2c** and **Sub-alternatives 3a, 3b**, and **3c**, the potential social effects would depend on how fishermen are affected by either higher trip limits and a shorter season, or lower trip limits and longer seasons. The higher trip limits would have the social benefit of increasing trip efficiency, especially for businesses who target multiple species and do not need one species to be open year-round. High trip limits can also result in the ACL being reached faster, triggering an early closure of the first fishing season. Alternatively, businesses focusing primarily on greater amberjack would benefit from a longer fishing season. However, trip limits that are too low can decrease trip efficiency, particularly for communities that require longer travel time to fishing grounds. The step-down in **Sub-alternative 2d** would likely help decrease the rate of harvest beyond that in **Sub-alternatives 2a, 2b** and **Preferred Sub-alternative 2c** and decrease the likelihood of an in-season closure.

Alternative 4 and its sub-alternatives would not establish a split season, but would reduce the commercial trip limit for greater amberjack. In general, a commercial trip limit may help slow the rate of harvest, lengthen a season, and prevent the ACL from being exceeded, but trip limits that are too low may make fishing trips inefficient and too costly if fishing grounds are too far away. Additionally, if the trip limit is too low, the commercial ACL may not be met.

Overall, the positive and negative effects on commercial fishermen of establishing a split season and associated trip limits under **Preferred Alternative 2** and **Alternative 3** or reducing the commercial trip limit under **Alternative 4** would depend on the proportion of the ACL allocated to each season, the length of each season, and the likelihood of commercial harvest being open during times of the year when it is profitable to target greater amberjack. **Table 4.3.1.2** provides projected quota closure dates under the different alternatives and sub-alternatives. **Alternative 1 (No Action)** would result in the shortest fishing season, with a projected closure in November. Under the split seasons proposed in **Preferred Alternative 2** and **Alterantive 3, Sub-alternative 2b** would result in the longest season. **Sub-alternative 4b** would result in the longest season overall, with no projected closure of the fishery. Generally, longer fishing seasons provide continued access for commercial fishermen and consistency for end users, if trip limits are sufficient to support commercial fishing activity.

4.3.4 Administrative Effects

Alternative 1 (No Action) would not change the administrative environment from its current state. Currently, there is a commercial quota monitoring system in place for greater amberjack that is utilized to monitor landings against the commercial quota. Since the 2015-2016 fishing year, commercial harvest has closed early due to landings reaching the ACL prior to the end of the fishing year. If total effort in the fishery remains consistent, it is possible the fishery would reach the ACL prior to the end of the fishing year. Therefore, NMFS would have to continue to prepare and issue fishery closure notices. Additionally, enforcement personnel would have to monitor the closures. With an in-season quota closure, there is potential that the landings do not reach 100% of the ACL. In that circumstance, guidance from the South Atlantic Council to NMFS recommended that the fishery should reopen if landings are less than 95% of the ACL, and the projected number of days that the fishery can reopen to meet the ACL is two or more days. Therefore, NMFS would have to monitor the landings and prepare a reopen notice.

Alternatives 2 and **3** (including **Sub-alternatives 2a**-**2d**, and **3a-3c**), would allocate the commercial ACL into quotas over two commercial fishing seasons. The season 1 trip limit for **Sub-alternatives 2a** and **3a** is larger than the season 1 trip limit for **Sub-alternative 2b-2d**, and **3b-3c**, respectively, so the seasonal quota may be met sooner in the season and would have the potential to be closed early. **Alternative 4** (including **Sub-alternatives 4a** and **4b** does not modify the fishing season, but would instead reduce the trip limit, compared to **Alternative 1 (No Action)**.

Of the four alternatives considered for management of greater amberjack, **Alternatives 2** and **3** would impose the most significant, direct administrative burden. Ongoing monitoring of the seasonal commercial quotas would be required. If the quota for each season is close to being met or exceeded twice each year, fishery managers will have to prepare and issue fishery closure notices twice as often as they would be required to do under **Alternative 1 (No Action)**. Additionally, enforcement personnel would be burdened with an increase in potential fishery closures, which they would have to monitor. Outreach materials would take the form of fishery bulletins and updates to NOAA Fisheries Service Southeast Region's web site. As with

Alternative 1 (No Action), there is twice the potential under **Alternatives 2** and **3** that the fishery would need to be reopened so that landings could reach the ACL.

4.4 Action 4. Establish a commercial split season and modify commercial trip limit for red porgy

4.4.1 Biological Effects

Average monthly commercial landings for red porgy by state from 2005-2012 and 2014-2016 are provided in **Figure 4.4.1.1** (see **Table S-9** in **Appendix J**). The year 2013 was excluded due to an in-season ACL closure. Commercial harvest of red porgy has been highest in July with North Carolina landing slightly more, on average, than other South Atlantic states. The percentage of annual red porgy landings from each state from 2002-2016 is provided in **Figure 4.1.1.2** (see **Table S-10** in **Appendix J**).

There has been one recent closure of red porgy commercial harvest, and landings from 2015 through 2017 have been below the commercial ACL (**Table 4.4.1.1**).

The Commercial Logbook provides landings at the trip-level in pounds, but the proposed red porgy trip limits are in numbers of fish. Commercial Trip Interview Program (TIP, accessed Oct 2017) data were used to evaluate the potential impacts of the various proposed trip limit alternatives. **Appendix J** provides details on methods used for these analyses. Projected quota closure dates are shown in **Table 4.4.1.2**.

> ***Alternatives****
>
> 1 (No Action). The commercial fishing year is the calendar year. A sale and purchase prohibition is in place from Jan 1 - Apr 30 each year. From May 1 - Dec 31 the trip limit is 120 fish.
>
> **2. Specify two commercial fishing seasons. Allocate 30% of the commercial ACL to the period Jan-Apr and 70% to the period May-Dec. Allow quota roll-over between seasons. Remove the Jan-Apr sale and purchase prohibition. Retain 120 fish from May-Dec and specify a commercial trip limit in Jan-Apr of:**
> - 2a. 30 fish
> - 2b. 45 fish
> - **2c. 60 fish**
>
> 3. Specify two commercial fishing seasons. Allocate 50% of the commercial ACL to the period Jan-Apr and 50% to the period May-Dec. Allow quota roll-over between seasons. Remove the Jan-Apr sale and purchase prohibition. Retain 120 fish in May-Dec and specify a commercial trip limit in Jan-Apr of:
> - 3a. 30 fish
> - 3b. 45 fish
> - 3c. 60 fish
>
> 4. Remove the harvest and possession restrictions, and sale and purchase prohibition during Jan-Apr each year. Specify a commercial trip limit of 120 fish from Jan-Dec.
>
> * Preferred indicated in bold. Refer to Chapter 2 for detailed language of alternatives.

Table 4.4.1.1. Red porgy total commercial landings (lbs ww and gw) and closure dates, 2004-2017.

Fishing Year	Landings	ACL	Units	%ACL	Closure
2017	114,874	164,000	ww	70.05	
2016	120,104	164,000	ww	73.23	
2015	146,056	164,000	ww	89.06	
2014	155,546	154,500	ww	100.68	
2013	163,337	153,000	gw	106.76	12/02/13
2012	155,743	190,050	gw	81.95	
2011	195,215	190,050	gw	102.72	
2010	152,743	190,050	gw	80.37	
2009	158,219	190,050	gw	83.25	
2008	165,365	127,000	gw	130.21	
2007	138,737	127,000	gw	109.24	
2006	80,619	127,000	gw	63.48	
2005	46,821	None	gw		
2004	47,814	None	gw		

Source: SERO ACL Monitoring Webpage [accessed 2/6/2018].

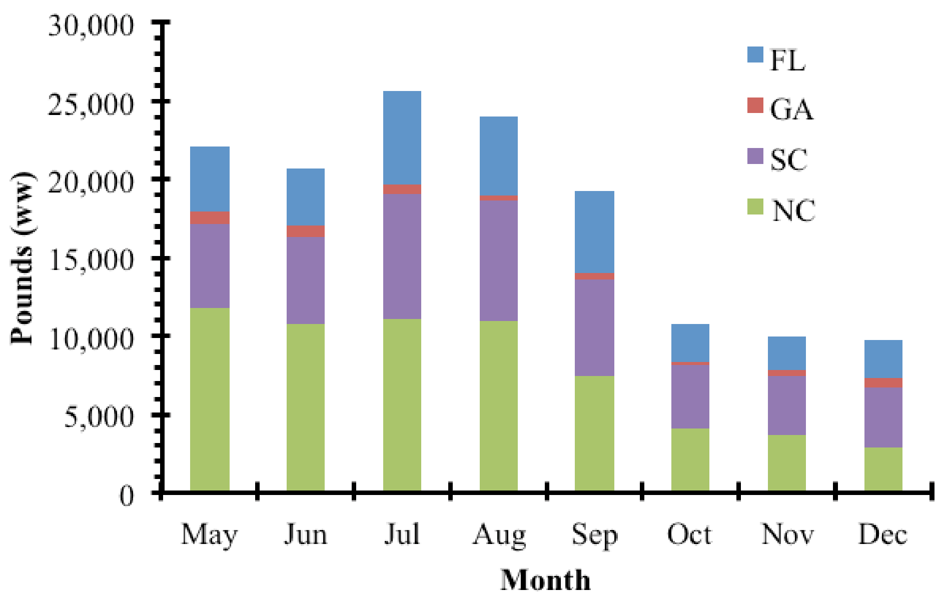

Figure 4.4.1.1. The average monthly South Atlantic red porgy commercial landings by state from 2005-2012 and 2014-2016 (lbs ww). The year 2013 was excluded due to a closure. Data from the months of January to April were not available due to the seasonal closure in place since 2000.
Source: SERO with data from Southeast Fisheries Science Center commercial (5/2/2017) ACL dataset.

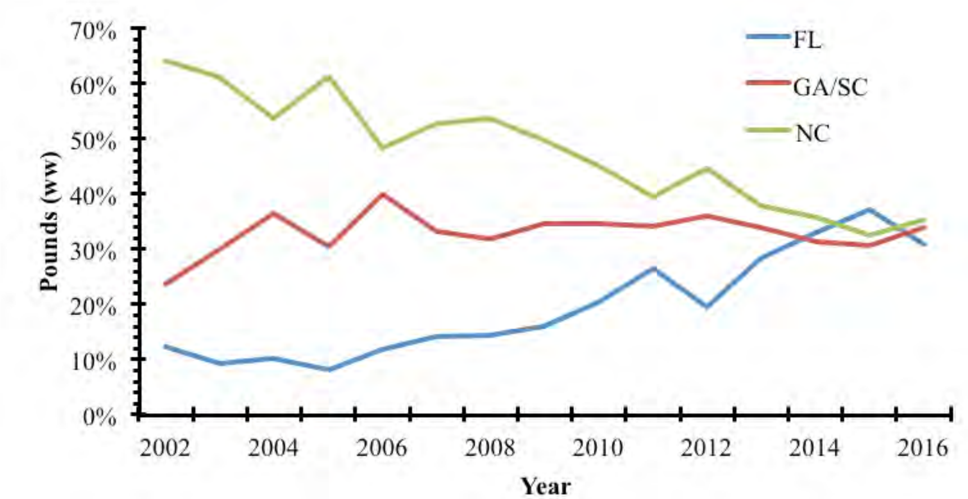

Figure 4.4.1.2. The percentage of annual South Atlantic red porgy commercial landings by state from 2002-2016 (lbs ww). Georgia and South Carolina were combined due to confidentiality concerns. Source: SERO with data from Southeast Fisheries Science Center commercial (5/2/2017) ACL dataset.

Table 4.4.1.2. Projected mean and 95% lower and upper (L95, U95) confidence limits for quota closure dates for red porgy under different alternatives proposed for Action 4 using the "Last 3" model (**Appendix J**). Blank cells denote no anticipated quota closure. Preferred alternative indicated in bold.

Alternative	**Season**	L95	**MEAN**	U95
1 (No Action)	Jan-Dec			11-Nov
Alt 2: Commercial ACL split 30% Jan-Apr and 70% May-Dec				
2a: 30 fish Jan-Apr	Jan-Apr			29-Apr
120 fish May-Dec	May-Dec		6-Nov	25-Aug
2b: 45 fish (Jan-Apr)	Jan-Apr			3-Apr
120 fish (May-Dec)	May-Dec		2-Oct	25-Aug
2c: 60 fish (Jan-Apr)	**Jan-Apr**		**22-Apr**	**20-Mar**
120 fish (May-Dec)	**May-Dec**		**25-Sep**	**25-Aug**
Alt 3: Commercial ACL split 50% Jan-Apr and 50% May-Dec				
3a: 30 fish (Jan-Apr)	Jan-Apr			
120 fish (May-Dec)	May-Dec		6-Nov	24-Aug
3b: 45 fish (Jan-Apr)	Jan-Apr			
120 fish (May-Dec)	May-Dec		2-Oct	9-Aug
3c: 60 fish (Jan-Apr)	Jan-Apr			
120 fish (May-Dec)	May-Dec		19-Sep	29-Jul
4: No split season; 120 fish year round	Jan-Dec		24-Aug	6-Jul

Under **Alternative 1 (No Action)**, 50% of the ACL is projected to be caught by May (95% CI: Apr-July) (**Appendix J**). Note that there is substantial uncertainty in these predictions, especially for the impacts of removing the Jan-Apr closure, which has been in place since 2000 (SAFMC date). Last 3 model projections do not predict a closure under **Alternative 1 (No Action)**.

Under **Preferred Alternative 2**, if the red porgy commercial ACL were split 30/70 between the two proposed seasons, trip limits of 30 fish (**Sub-alternative 2a**) and 45 fish (**Sub-alternative 2b**), would result in no in-season closure during January through April (Season 1). A trip limit of 60 fish (**Preferred Sub-alternative 2c**) during season 1 would allow commercial harvest of red porgy until late April. During May through December (Season 2) a 120 fish trip limit, **Sub-alternatives 2a through Preferred Sub-alternative 2c** would allow harvest until early November, early October, and late September, respectively (**Table 4.4.1.2**).

Under a 50/50 split of the commercial ACL, as proposed under **Alternative 3**, trip limits of 30, 45, and 60 fish (**Sub-alternatives 3a-3c**) are not expected to result in in-season closures during January-April (Season 1). During May through December (Season 2) and under a trip limit of 120 fish as proposed by **Sub-alternatives 3a-3c**, harvest would continue until early November, early October, and mid-September, respectively (**Table 4.4.1.2**). Finally, if the commercial ACL were not split and a 120 fish trip limit were imposed year-round, as proposed under **Alternative 4**, commercial harvest of red porgy would likely extend to mid-August.

In the South Atlantic, red porgy spawn from January through May and spawning activity peaks from January through March (**Table 3.2.1**); hence, the current January-April prohibition on commercial harvest captures the majority of the spawning season for this species. However, during this time, harvest for two co-occurring species, vermilion snapper and gray triggerfish, is ongoing. Consequently, fishermen report high numbers of red porgy discards during this time period. Red porgy discards from 2014 through 2016 were high during the spawning season closure (January through April) with a peak in February. Eighty-two percent of annual red porgy discards were during January-April. High discards were also observed in August (**Table 4.1.1.3**). The discard mortality rate applied to the commercial fleet in the latest update assessment (SEDAR 1 2012 Update) was 35%. Thus, the benefits of a spawning season closure for red porgy are reduced by the amount of discards when fishermen target other species such as vermilion snapper and gray triggerfish. As mentioned previously, however, there is considerable uncertainty in predicting the effects of removing the closure on the level of commercial catch. The biological impacts of **Preferred Alternative 2** and **Alternatives 3** and **4** relative to the status quo are likely to be neutral since overall harvest would continue to be limited to the ACL and split-season quotas, and AMs would be triggered if the ACL or quotas were exceeded.

4.4.2 Economic Effects

Alternative 1 (No Action) would maintain the current commercial fishing season for red porgy, which is the calendar year, with a restriction on commercial sale and purchase during January 1 through April 30. It would also maintain the current commercial trip limit of 120 fish for May 1 through December 31. Estimated closure dates for this and the other alternatives were generated using two separate modeling approaches as described in Appendix J, (1) based on the last three years of landings data (2014-2016; "Last 3"), and (2) a seasonal auto-regressive integrated moving average (SARIMA) time series model. The results of these models diverge by as much as four months in some cases. Additionally, the "Last 3" model predicts various quota closures would occur under some of the alternatives; whereas, the SARIMA model predicts no closures. As such, quantitative estimates of season length and economic effects will not be provided until one of the models is deemed to be the best scientific information available by the Council's Scientific and Statistical Committee (SSC).

Both **Preferred Alternative 2** and **Alternative 3** would split the current red porgy commercial fishing year into two separate seasons, the first one from January 1 through April 30, and the second one from May 1 through December. The restriction on commercial sale and purchase during January through April would be removed as well. **Preferred Alternative 2** would allocate 30% of the quota to the first season and 70% to the second season; whereas, **Alternative 3** would implement a 50/50 split. Under both of these alternatives, any unused quota from the first season would be carried over to the second season. **Sub-alternatives 2a**, **2b,** and **Preferred Sub-alternative 2c** and **Sub-alternatives 3a–3c** mirror each other and would set commercial trip limits for each season that range from 30 to 60 fish as described in Section 2.4. **Alternative 4** would keep the current fishing season but would remove the harvest and possession restrictions, as well as the sale and purchase prohibition, during Jan-Apr each year. It would also establish a trip limit of 120 fish for January through December.

The economic effects of these alternatives relative to the status quo and to each other would depend on aggregate annual harvest levels and seasonal shifts in landings. Removing the prohibition on sale and purchase of red porgy during January through April may result in the full ACL being harvested, which would be expected to increase aggregate annual ex-vessel revenue. It could also result in in-season quota closures, which may negatively affect individual vessels that depend on red porgy. Reductions in the commercial trip limit may help delay such closures, but could also negatively affect harvesting efficiency. The economic effects on individual harvesters from **Preferred Alternative 2**, **Alternative 3**, **Alternative 4**, and the corresponding sub-alternatives would depend on each harvester's profit maximization strategy, their dependence on red porgy, their seasonal fishing behavior, and their ability to adapt to the changing regulations. These types of individual effects cannot be quantified with available data. Estimates of season length and aggregate annual ex-vessel revenue, however, will be provided along with a comparison of each alternative and sub-alternative upon selection of the preferred forecast model.

Indirect economic effects would depend on aggregate harvest levels, changes in seasonal fishing patterns, and potential changes in discard levels. If the red porgy stock is negatively impacted by this action, as a result of increased fishing pressure or discards, it could result in future reductions in allowable harvest levels and associated ex-vessel revenue in the long-term.

4.4.3 Social Effects

A description of the communities that would most likely be affected by changes in commercial management of red porgy can be found in **Section 3.4** and includes: Mayport, Saint Augustine, and Port Orange, Florida; Little River, Murrells Inlet, and Charleston, South Carolina; Supply, Beaufort, Morehead City, and Southport, North Carolina. These communities would likely be affected by changes to the commercial fishing year and trip limits for red porgy.

Red porgy is under restrictive catch limits, and a split season under **Preferred Alternative 2** and **Alternative 3** may help to extend commercial harvest longer than under **Alternative 1 (No Action)**. In general, a split season would be most beneficial for fishermen targeting other species in the beginning of the year, because it would ensure that a portion of the commercial ACL would be available later in the year. Establishing a split season could result in fishermen shifting effort to or from a certain species (including targets on multi-species trips) based on economic, regulatory, biological, or environmental changes in the fishery resulting from changes in access to the red porgy resource.

For changes in the trip limit under **Sub-alternative 2a, 2b** and **Preferred Sub-alternative 2c** and **Sub-alternatives 3a, 3b** and **3c**, the potential social effects would depend on how fishermen are affected by either higher trip limits and a shorter season, or lower trip limits and longer seasons. The higher trip limit in the first season would have the social benefit of increasing trip efficiency, especially for businesses who target multiple species and do not need one species to be open year-round. High trip limits can also result in the ACL being reached faster, triggering an early closure of the first fishing season. Alternatively, businesses focusing primarily on red porgy would benefit from a longer fishing season. However, trip limits that are too low can decrease trip efficiency, particularly for communities that require longer travel time to fishing grounds.

Overall, the positive and negative effects on commercial fishermen of establishing a split season under **Preferred Alternative 2** and **Alternative 3** would depend on the proportion of the ACL allocated to each season, the length of each season, and the likelihood of commercial harvest being open during times of the year when it is profitable to target red porgy. **Table 4.4.1.2** provides projected quota closure dates under the different alternatives and sub-alternatives. Under **Preferred Alternative 2**, a 30/70 split of the ACL, and **Alternative 3**, a 50/50 spilt of the ACL, **Sub-alternative 2a** and **Sub-alternative 3a** result in no closure during the first season and a second season closure in early November. **Alternative 4** would result in a projected season closure in Mid-August. Generally, longer fishing seasons provide continued access for commercial fishermen and consistency for end users, if trip limits are sufficient to support commercial fishing activity.

Removing the restricted harvest limit for January 1 through April 30 under **Preferred Alternative 2, Alternatives 3** and **4** may provide benefits to the commercial fleet by increasing access but will also increase the rate of harvest. Generally, higher catch limits are expected to be more beneficial to fishermen and communities by increasing access to red porgy, if harvest is not negatively affecting the long-term health of the stock, which may be a concern with peak spawning occurring from January through March. However, vermilion snapper and gray triggerfish are also harvested during this time resulting in high red porgy discards thus reducing the benefit of the spawning closure. Removing the restricted harvest would have the social benefit of aligning regulations with the way the fishery is conducted.

4.4.4 Administrative Effects

Alternative 1 (No Action) would not change the administrative environment from its current state. Currently, there is a commercial quota monitoring system in place for red porgy that is utilized to monitor landings against the commercial quota. Since 2007, landings have reached at least 70% of the ACL, and closed in 2013 prior to the end of the fishing year when the ACL was met. If total effort in the fishery remains consistent, it is possible the fishery could reach the ACL prior to the end of the fishing year. Therefore, NMFS would need to prepare and issue fishery closure notices. Additionally, enforcement personnel would have to monitor the closures. With an in-season quota closure, there is potential that the landings do not reach 100% of the ACL. In that circumstance, guidance from the South Atlantic Council to NMFS recommended that the fishery should reopen if landings are less than 95% of the ACL, and the projected number of days that the fishery can reopen to meet the ACL is two or more days. Therefore, NMFS would have to monitor the landings and prepare a reopen notice.

Alternatives 2, **3**, and **4** would remove the seasonal harvest sale and purchase restriction. The sub-alternatives for **Alternatives 2** and **3** would allocate the commercial ACL into quotas over two commercial fishing seasons. **Alternative 4** would specify a trip limit for the fishing year, so the ACL may be met sooner in the season and would have the potential to be closed early. Of the four alternatives considered for management of red porgy, **Alternatives 2** and **3** would impose the most significant, direct administrative burden. Ongoing monitoring of the seasonal commercial quotas would be required. However, if the quota for each season is close to being met or exceeded twice each year, fishery managers will have to prepare and issue fishery closure notices twice as often as they would be required to do under **Alternative 1 (No Action)**. Additionally, enforcement personnel would be burdened with an increase in potential fishery closures, which they would have to monitor. Outreach materials would take the form of fishery bulletins and updates to NOAA Fisheries Service Southeast Region's web site to. As with **Alternative 1 (No Action)**, there is twice the potential under **Alternatives 2** and **3** that the fishery would need to be reopened so that landings could reach the ACL.

4.5 Action 5. Modify the commercial trip limit for vermilion snapper

4.5.1 Biological Effects

A commercial split season for vermilion snapper was implemented in the South Atlantic in 2009 (SAFMC 2009a). There have been several in-season quota closures in recent years (**Table 4.5.1.1**).

To predict the effect of proposed modifications on commercial landings, a projection model using landings data for 2014 through 2016 was used ("Last 3" model; **Appendix J**). The model predicts the vermilion snapper January-June seasonal quota under **Alternative 1 (No Action)** would be met by March (95% CI: Mar-Apr) (**Appendix J**). Projected trip limit reduction dates and closure dates are provided in **Tables 4.5.1.2** and **4.5.1.3** for Seasons 1 and 2, respectively.

Alternatives*

1 No Action. The commercial fishing year is the calendar year. The commercial ACL is allocated equally into two 6-month seasons. Roll-over of uncaught ACL between seasons is allowed. The commercial trip limit is 1,000 pounds gutted weight (lbs gw). For both seasons, when 75% of the seasonal quota is met or is projected to be met, the trip limit is reduced to 500 pounds lbs gw.

2. Retain the commercial trip limit and trip limit reduction in Season 1. For Season 2, reduce the commercial trip limit to 750 lbs gw and remove the trip limit reduction. Allow quota roll-over between seasons.

3. Retain the commercial trip limit and trip limit reduction in Season 1. For Season 2, reduce the trip limit to 500 lbs gw and remove the trip limit reduction. Allow quota roll-over between seasons.

4. Modify the commercial trip limit for both seasons and remove trip-limit reductions:
 - 4a. 1,000 pounds
 - 4b. 850 pounds
 - 4c. 700 pounds

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

Table 4.5.1.1. Vermilion snapper total commercial landings (lbs gw and ww) and closure dates, 2008-2017.

Fishing Year	Landings	ACL	Units	ACL	Trip Limit	Closure
January 1 -June 30, 2017	410,786	431,460	ww	95.21	3/22/2017	5/17/17
July 1 - Dec 31, 2017	465,905	431,460		103.05	10/2/17	10/17/17
January 1 - June 30, 2016	393,911	431,460	ww	91.30	3/2/2016	3/29/2016
July 1 - Dec 31, 2016	393,506	432,305		91.03	8/28/2016	10/11/16; reopened 12/14-12/15/16
Jan 1 - June 30, 2015	431,760	438,260		98.52	3/2/2015	4/15/2015
July 1 - Dec 31, 2015	452,519	438,260		103.25	9/10/2015	9/22/2015
Jan 1 - June 30, 2014	463,881	446,080		103.99	3/11/2014	4/19/2014
July 1 - Dec 31, 2014	461,061	446,080		103.36	8/23/2014	9/12/2014
Jan 1 - June 30, 2013	312,150	466,480		66.92		2/13/2013
July 1 - Dec 31, 2013	665,613	613,278		108.53		12/2/2013

Jan 1 - June 30, 2012	395,733	315,523		125.42		2/29/2012
July 1 - Dec 31, 2012	499,980	302,523		165.27		9/28/2012
Jan 1 - June 30, 2011	333,148	315,523		105.04		3/10/11; Re-opened 5/1/11-5/8/11
July 1 - Dec 31, 2011	585,742	302,523		193.62		9/30/2011
Jan 1 - June 30, 2010	356,823	315,523		113.09		3/19/2010
July 1 - Dec 31, 2010	520,067	302,523	gw	171.91		10/6/2010
Jan 1 - June 30, 2009	421,831	315,523		133.69		
July 1 - Dec 31, 2009	406,166	302,523		134.26		9/18/2009
Jan 1 - Dec 31, 2008	1,100,812	1,100,000		100.07		
	983,909	1,100,000		89.45		
	768,193	1,100,000		69.84		
	1,019,557	None				
	1,008,714	None				

Source: SERO ACL Monitoring Webpage [accessed 2/6/2018].

Table 4.5.1.2. Projected mean and 95% lower and upper (L95, U95) confidence limits trip limit reduction and quota closure dates for vermilion snapper under different alternatives proposed for Action 5 using the "Last 3" projection model (**Appendix J**) for Season 1 (January through June).

SEASON 1			
TRIP LIMIT REDUCED			
Alternative	**L95**	**MEAN**	**U95**
1: 1,000 pounds with reduction	28-Mar	**4-Mar**	20-Feb
2: 1,000 pounds with reduction	28-Mar	**4-Mar**	20-Feb
3: 1,000 pounds with reduction	28-Mar	**4-Mar**	20-Feb
FISHERY CLOSED			
1: 1,000 pounds with reduction	27-Apr	**31-Mar**	14-Mar
2: 1,000 pounds with reduction	27-Apr	**31-Mar**	14-Mar
3: 1,000 pounds with reduction	27-Apr	**31-Mar**	14-Mar
4a: 1,000 pounds, no reduction	19-Apr	**24-Mar**	7-Mar
4b: 850 pounds, no reduction	26-Apr	**31-Mar**	13-Mar
4c: 700 pounds, no reduction	5-May	**7-Apr**	21-Mar

For the first vermilion snapper commercial season (January through June), under **Alternatives 1 (No Action)** through **3** (1,000-pound trip limit with trip limit reduction), the trip limit reduction to 500 pounds is predicted to occur in early March with the seasonal quota being harvested by the end of March. Removing the trip limit reduction and implementing trip limits of 1,000, 850, and 700 pounds in the first season, as proposed under **Sub-alternatives 4a, 4b and 4c**, respectively, would allow commercial harvest of vermilion snapper to continue until late March/early April (**Table 4.5.1.2**).

Table 4.5.1.3. Projected mean and 95% lower and upper (L95, U95) confidence limits trip limit reduction and quota closure dates for vermilion snapper under different alternatives proposed for Action 5 using the "Last 3" projection model (**Appendix J**) for Season 2 (July through December).

SEASON 2			
TRIP LIMIT REDUCED			
Alternative	**L95**	**MEAN**	**U95**
1: 1,000 pounds with reduction	18-Sep	**25-Aug**	13-Aug
FISHERY CLOSED			
1: 1,000 pounds with reduction	25-Oct	**17-Sep**	31-Aug
2: 750 pounds, no reduction	1-Nov	**20-Sep**	1-Sep
3: 500 pounds, no reduction	18-Dec	**14-Oct**	19-Sep
4a: 1,000 pounds, no reduction	13-Oct	**9-Sep**	24-Aug
4b: 850 pounds, no reduction	23-Oct	**14-Sep**	28-Aug
4c: 700 pounds, no reduction	8-Nov	**23-Sep**	4-Sep

For the second season (July through December), the trip limit reduction to 500 pounds under **Alternative 1 (No Action)** would be expected in late August. There would not be a trip limit reduction under **Alternatives 2** or **3**. Closures would be expected in mid- to late September under **Alternatives 1 (No Action)** and **2** and mid-October under **Alternative 3**. Trip limits proposed under **Sub-alternatives 4a**-**4c** would result in harvest of vermilion snapper closing in early, mid- and late-September, respectively.

Biological effects are expected to be neutral for **Alternatives 2-4** relative to the status quo (**Alternative 1 (No Action)**. In general, trip limits do not result in biological effects, positive or negative, since overall harvest is limited by the ACL and AMs are in place to ensure the ACL is not exceeded.

Mean monthly estimates of commercial discards for the affected species in this amendment, including vermilion snapper, from the SEFSC Supplemental Commercial Discard Logbook (accessed May 2017) are provided in **Table 4.1.1.3**. During 2014 through 2016 vermilion snapper discards peaked in November and December, when commercial harvest for the species had closed due to reaching the ACL. High discard numbers were also observed in May.

Peak spawning activity for vermilion snapper is from June through August (**Table 3.2.1**). All proposed alternatives are estimated to close Season 1 prior to June, with a reopening for Season 2 in July. Only **Alternative 1 (No Action)** is estimated to close sometime in August possibly having a small biological benefit over **Alternatives 2**, **3** and **4** which could result in fishing activity continuing past peak spawning.

4.5.2 Economic Effects

Alternative 1 (No Action) would maintain the current 1,000 pounds (lbs) gutted weight (gw) vermillion snapper commercial trip limit, including step-down (trip limit reduction) provisions for each season. Estimated closure dates for this and the other alternatives were generated using two separate modeling approaches as described in Appendix J, (1) based on the last three years of landings data (2014-2016; "Last 3"), and (2) a seasonal auto-regressive integrated moving average (SARIMA) time series model. The results of these models diverge by as much as a month in some cases. As such, quantitative estimates of season length and economic effects will not be provided until one of the models is deemed to be the best scientific information available by the Council's Scientific and Statistical Committee (SSC).

Alternative 2 and **Alternative 3** would retain the current commercial trip limit and step-down provisions for Season 1, but would lower the trip limit for Season 2 to 750 lbs gw and 500 lbs gw, respectively. Under both of these alternatives, quota rollovers between seasons would still be allowed, but the step-down provisions for Season 2 would be removed. Alternative 4 would remove step-down provisions altogether and set a constant trip limit for both seasons of 1,000 lbs gw (**Sub-alternative 4a**), 850 lbs gw (**Sub-alternative 4b**), or 700 lbs gw (**Sub-alternative 4c**).

In aggregate, the expected annual landings and ex-vessel revenue derived from vermillion snapper would likely be similar under each of the alternatives, because the full ACL is expected to be achieved under each of the alternatives. However, seasonal differences in prices could result in some small differences in aggregate annual ex-vessel revenue estimates. Due to differences in estimated closure dates across forecast models, no quantitative estimates of season length or economic effects will be provided at this time, nor will a comparison of economic effects be made between alternatives.

The economic effects on individual harvesters from **Alternatives 2-4** would depend on each harvester's profit maximization strategy, their dependence on vermillion snapper, their seasonal fishing behavior, and their ability to adapt to the changing regulations. Some harvesters may benefit from a redistribution of vermillion snapper fishing days, while others may be hindered by a lower trip limit or change in availability of vermillion snapper during the year. Lower trip limits can reduce profits through a reduction in harvesting efficiency. Higher trip-level revenues later in the year as a result of a longer season could, however, offset the negative effects experienced earlier in the year. These types of individual effects cannot be quantified with available data.

Because the overall level of harvest is not expected to change under **Action 1**, the impacts on the vermillion snapper stock are expected to be minimal under each of the alternatives. However, unforeseen changes in discards or spawning levels due to temporal changes in fishing pressure could challenge this assumption and result in future reductions in allowable harvest levels and associated ex-vessel revenue in the long-term. Also, shifts in targeting behavior as a result of this action could potentially have negative impacts on other commercially-important stocks. It is assumed that the likelihood of such indirect economic effects would be low.

4.5.3 Social Effects

A description of the communities that would most likely be affected by changes in commercial management of vermilion snapper can be found in **Section 3.4** and includes: Mayport, Saint Augustine, and Port Orange, Florida; Murrells Inlet and Little River, South Carolina; and Southport, Morehead City, Oak Island, Beaufort, and Supply, North Carolina.

In general, a commercial trip limit may help slow the rate of harvest, lengthen a season, and prevent the ACL from being exceeded, but trip limits that are too low may make fishing trips inefficient and too costly if fishing grounds are too far away. A longer open season could be beneficial to the commercial fleet and to end users of vermilion snapper (restaurant owners, fish houses, and consumers) by improving consistency of availability.

The vermilion snapper annual catch limit is currently evenly split between two seasons of equal length. The trip limit changes proposed under **Alternatives 2** through **4**, would result in potential social effects that would depend on how fishermen are affected by either higher trip limits and a shorter season, or lower trip limits and longer seasons. The higher trip limit in the second season under **Alternative 2** would have the social benefit of increasing trip efficiency, especially for businesses who target multiple species and do not need one species to be open year-round. High trip limits can also result in the ACL being reached faster, triggering an early closure of the first fishing season. Alternatively, businesses focusing primarily on vermilion snapper would benefit from a longer fishing season under **Alternative 3**. Though, trip limits that are too low can decrease trip efficiency, particularly for communities that require longer travel time to fishing grounds.

Alternative 4/Sub-alternatives 4a would retain the current trip limit for vermilion snapper and remove the trip limit reduction once 75% of the seasonal quotas are met. **Sub-alternatives 4b** and **4c** would also decrease the trip limit resulting in a longer fishing season. However, if these limits are too low, they can negatively impact efficiency and profitability for participants in the commercial vermilion snapper fishery. Removal of trip limit reductions could increase the rate of harvest beyond that in **Alternative 1 (No Action)** and increase the likelihood of an in-season closure, shortening the season and reducing access to the fishery.

Tables 4.5.1.2 and **4.5.1.3** provide projected quota closure dates under the different alternatives and sub-alternatives for Season 1 and Season 2, respectively. **Alternative 1 (No Action)** would result in the shortest season, while **Alternative 4/Sub-alternative 4c** would result in the longest season. Generally, longer fishing seasons provide continued access for commercial fishermen and consistency for end users, if trip limits are sufficient to support commercial fishing activity.

4.5.4 Administrative Effects

Alternative 1 (No Action) would not change the administrative environment from its current state. Currently, there is a commercial quota monitoring system in place for vermilion snapper that is utilized to monitor landings against the commercial quota. Since 2014, there has been a commercial harvest trip limit reduction for each six-month fishing season. Additionally, since the 2009 July through December fishing season, commercial harvest has closed early due to landings reaching the ACL prior to the end of the fishing year. If total effort in the fishery remains consistent, it is likely the fishery would require trip limit reductions during each fishing season, and also need to be closed early due to reaching the ACL prior to the end of the fishing year. Therefore, fishery managers will have to continue to prepare and issue fishery trip limit reduction, and closure notices, for each six-month season. Additionally, enforcement personnel would have to monitor the closures. With an in-season quota closure, there is potential that the landings do not reach 100% of the ACL. In that circumstance, guidance from the SAFMC to NMFS recommended that the fishery should reopen if landings are less than 95% of the ACL, and the projected number of days that the fishery can reopen to meet the ACL is two or more days. Therefore, the fishery managers would have to monitor the landings and prepare a reopen notice.

Alternatives 2 and **3** would modify the commercial trip limit for the second (July-December) fishing season. **Alternative 2** would lower the second season trip limit to 500 lbs, which may slow the rate of harvest and lengthen the season, which could potentially reduce the need for fishery managers to prepare a trip limit reduction notice and/or a closure notice. **Alternative 3** would lower the second season trip limit even further than **Alternative 1 (No Action)** and **Alternative 2**, and remove the trip limit reduction requirement in the second season. **Alternative 4** would remove the trip limit reduction requirements, and trip limit reduction notices would not need to be prepared which may lead to the ACL being met sooner in the season and would have the potential to be closed early. Out of the reduced trip limit sub-alternatives, **Sub-Alternative 4c, 4b,** have the lowest seasonal trip limits, followed by **Sub-Alternative 4a**.

Of the four alternatives considered for management of vermilion snapper, **Alternative 1 (No Action)** would impose the most significant, direct administrative burden. Ongoing monitoring of the two seasonal commercial quotas would be required. Over the course of a given fishing year, and two 6-month seasonal quotas, there is potential under **Alternative 1 (No Action**), for a total of six in-season notices (i.e., trip limit reduction notice, closure notice, and reopening notice, for each of two seasons) that would need to be prepared by fishery managers. Under **Alternative 2** and **3**, there is potential that fishery managers may have to prepare only five in-season notices since the trip limit reduction is removed from the second season. **Alternative 4** may have to prepare only four in-season notices since the trip limit reduction is removed from both seasons. Additionally, enforcement personnel would be burdened with more frequent potential fishery closures, which they would have to monitor. Outreach materials would take the form of fishery bulletins and updates to NOAA Fisheries Service Southeast Region's web site.

4.6 Action 6. Implement a minimum size limit for almaco jack for the commercial sector

4.6.1 Biological Effects

*Alternatives**

1 (No Action). There is no commercial minimum size limit specified for almaco jack.

2. Specify a minimum size limit for almaco jack for the commercial sector:
- **2a. 20 inches fork length**
- 2b. 22 inches fork length
- 2c. 24 inches fork length
- 2d. 26 inches fork length

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

Almaco jack in included in the 'Other Jacks Complex' along with lesser amberjack and banded rudderfish. Species groupings, or complexes, for species managed under the Snapper Grouper FMP were created with implementation of the Comprehensive ACL Amendment (SAFMC 2011). In that amendment the South Atlantic Council adopted the approach to "help prevent overfishing of species in stock complexes while mitigating variability in landings data by combining species into a single, complex-level ACL." The approach streamlined and simplified ACL management, and provided an incentive to move stocks up the ABC control rule tiers by promoting individual ACLs for species with completed assessments. The adopted approach also promoted attaining optimum yield (OY) for assessed stocks while providing a mechanism to prevent overfishing of the unassessed stocks, which are potentially less productive and/or more vulnerable.

Appendix O of the Comprehensive ACL Amendment (SAFMC 2011) contains the detailed methodology for the existing species groupings. The discussion pertaining to jacks, cites issues with misidentification potentially leading to "issues computing single species' ACLs unless the rate of misidentification is quantifiable or has been (and remains) constant through time. The use of a 'Jacks' complex would mitigate issues with species identification by regulating misidentified species together. These findings are reasonably consistent with Shertzer and Williams (2008); using hierarchical cluster analysis, they identified a complex including banded rudderfish and almaco jack in the headboat sector, and greater amberjack and almaco jack in the commercial sector."

Furthermore, almaco jack was identified as the most vulnerable species in the Jacks Complex in analyses that supported the implementations of the various species complexes in the Comprehensive ACL amendment (SAFMC 2011); "Vulnerabilities were expressed as 'Overall Risk Scores' from the MRAG Americas Productivity Susceptibility Analyses (PSA) for the SAFMC Snapper Grouper FMU (MRAG Americas 2009 a, b)."

Under current conditions, using data from 2014 through 2016, 88.5% of almaco jack landed commercially (by weight) in the South Atlantic are above 20 inches and 66% of the catch is above 26 inches (**Table 4.6.1.1**).

Table 4.6.1.1. Percent of commercial catch (in pounds) comprised of almaco jack below and above each of the proposed minimum sizes limits, 2014-2016. Preferred indicated in bold.

Min Size	Pounds of Fish	
	% > min size	% < min size
20”	**88.5%**	**11.5%**
22”	82.6%	17.4%
24”	74.6%	25.4%
26”	65.8%	34.2%

Source: SAFMC

Appendix K contains detailed methodology for the analyses presented below. To explore the relative effect of the proposed almaco jack minimum size limit alternatives on commercial landings, the average annual landings of Other Jacks for 2014-2016 were calculated for each alternative (**Figure 4.6.1.1**). The data show that as the minimum size of almaco jack increases under **Preferred Alternative 2, Sub-Alternatives 2a (Preferred)-2d**, the estimated annual landings of Other Jacks decrease. None of the proposed minimum size limit alternatives keeps the annual landings of Other Jacks below the commercial ACL.

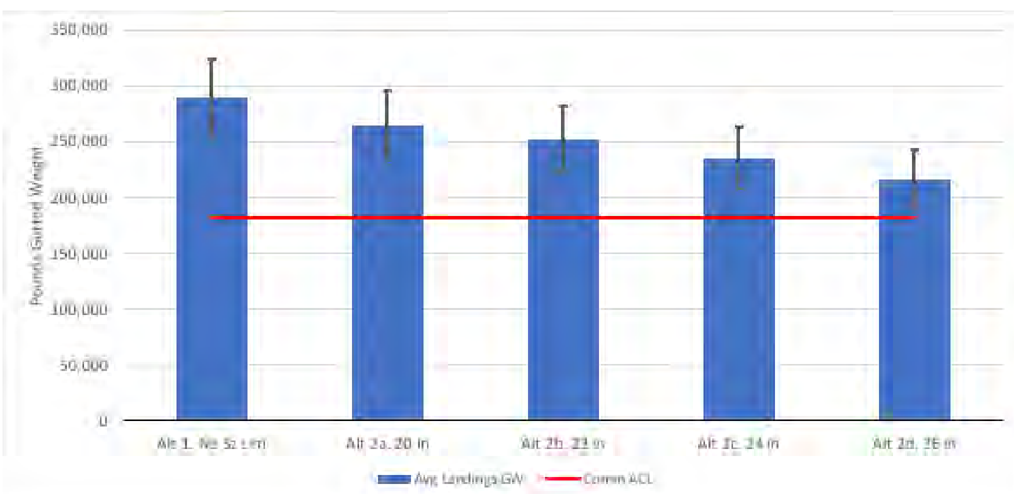

Figure 4.6.1.1. Estimated annual commercial landings of the Jacks Complex for each of the alternative almaco jack minimum size limits under Action 6 with 95% confidence intervals and the commercial ACL for reference.
Source: SAFMC

Table 4.6.1.2 shows the estimated closure dates and 95% confidence intervals (CI) for **Alternatives 1 (No Action)** and **Preferred Alternative 2**. Under **Alternative 1 (No Action)**, the commercial ACL for the Other Jacks Complex is expected to be met in early July. The proposed minimum size limits under **Sub-alternatives 2a (Preferred)-2d** might allow harvest to continue increasingly longer; from 12 additional days under a 20-inch minimum size limit (**Preferred Sub-alternative 2a**) to 82 additional days under a 26-inch minimum size limit (**Sub-**

alternative 2d). Biological benefits on the almaco jack stock would be realized if the minimum size limit allowed for an increase in the reproductive potential of the population. Thre is no recent information in the scientific literature regarding length at maturity for almaco jack.

Table 4.6.1.1. Estimated closure dates for the Other Jacks Complex and estimated total landings with 95% confidence interval (CI) based on proposed almaco jack minimum sizes limit alternatives. Preferred indicated in bold.

Alternatives	Closure Date	Total Landings	95% CI
1: No Size Limit	2-Jul	289,392	34,109
2a: 20 in	**14-Jul**	**265,082**	**31,125**
2b: 22 in	26-Jul	252,551	29,610
2c: 24 in	18-Aug	235,535	27,583
2d: 26 in	23-Sep	216,972	25,422

Source: SAFMC

4.6.2 Economic Effects

Alternative 1 (No Action) would not specify a commercial minimum size limit (MSL) for almaco jack. Under this alternative, the other jacks complex fishing season would be expected to close on July 2 (**Table 4.6.1.2**). **Preferred Alternative 2** would specify a MSL for almaco jack of 20 inches (in) fork length (FL) (**Preferred Sub-alternative 2a**), 22 in FL (**Sub-alternative 2b**), 24 in FL (**Sub-alternative 2c**), or 26 in FL (**Sub-alternative 2d**). Each incremental increase in the MSL would be expected to successively increase the season length for the other jacks complex by further reducing daily harvest rates of almaco jack (**Table 4.6.1.2**). Due to time constraints, the economic component of the forecast model is not yet complete. Estimates of aggregate annual ex-vessel revenue will be provided upon completion of the model, along with a comparison of the alternatives. However, it is expected that the ACL would be fully achieved under all of the alternatives and so there will likely be little difference in aggregate annual ex-vessel revenue across alternatives.

By effectively lowering catch rates earlier in the year in exchange for a longer season, **Preferred Alternative 2** may benefit some vessels and fishing businesses in terms of increased access and negatively affect others in terms of lower trip-level landings or increased harvesting costs. The magnitude of such effects would depend on the harvesting characteristics and profit maximization strategies of each vessel or fishing business. These types of individual economic effects cannot be quantified with existing data, but may be amplified by each incremental increase in the minimum size limit.

Specifying a MSL may have long-term positive or negative indirect economic effects. These would depend on the extent to which almaco jack discards increase, as well as the ability of the MSL to enhance the spawning potential of the stock. If the stock grows and future catch limits become less restrictive as a result of **Preferred Alternative 2**, it could generate greater long-term harvest revenue and vice versa.

4.6.3 Social Effects

A description of the communities that would most likely be affected by changes in commercial management of the Other Jacks can be found in **Section 3.4** and include: Islamorada, Palm Beach Gardens, Boca Raton, Daytona Beach, Miami, Delray Beach, and Marathon Shores, Florida; and Hampstead, Wilmington, and Morehead City, North Carolina. These communities would likely be affected by changes to the minimum size limit for almaco jack.

Specifying a minimum size limit under **Preferred Alternative 2** does not reduce harvest below the ACL and would not result in a substantially longer fishing season (**Table 4.6.1.2**). The social effects of specifying a minimum size limit for almaco jack would be associated with the positive and negative biological effects on the species (see **Section 4.6.1**). Negative effects of specifying the minimum size limit could result from increased discards. However, only about 12% of the almaco jack being harvested commercially are below the proposed 20-inch minimum size limit (**Table 4.6.1.1**) and discard mortality of jacks is estimated to be low. Alternatively, specifying a size limit may protect reproductive potential. This would be expected to contribute to the sustainability of harvest and the health of these stocks and provide for long-term social benefits.

4.6.4 Administrative Effects

There is no minimum size limit already in place for almaco jack in the South Atlantic Region; however, changing the minimum size limit under **Alternative 2** would not be unusually burdensome. Administrative impacts on the agency associated with **Alternative 2** (including **Sub-Alternatives 2a-2d**) would be incurred by rulemaking, outreach, education, and enforcement.

4.7 Action 7. Implement a commercial trip limit for the Other Jacks Complex

4.7.1 Biological Effects

There have been in-season commercial closures for the Other Jacks Complex since an ACL was implemented in 2012 (**Table 4.7.1.1**). This has prompted the Council to explore the management measures proposed in this action to lengthen the season. The analyses presented here account for the specification of a minimum size limit under Action 6. Refer to **Appendix K** for detailed methodology and assumptions.

Alternatives*

1 No Action. There is no commercial trip limit for the Other Jacks Complex (lesser amberjack, almaco jack, and banded rudderfish).

2. Establish a commercial trip limits with no reductions:
- **2a. 500 lbs gw**
- 2b. 400 lbs gw
- 2c. 300lbs gw

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

Table 4.7.1.1. Other Jacks Complex recent landings (lbs) and quota closures.

Fishing Year	Current Landings	ACL	Units	ACL	Closure Date
2017	189,033	189,422	ww	99.79	8/4/2017
2016	203,052	189,422	ww	107.20	8/9/2016
2015	187,189	189,422	ww	98.82	6/23/2015
2014	236,453	189,422	ww	124.83	7/15/2014
2013	205,947	189,422	ww	108.72	6/18/2013
2012	333,590	193,999	ww	171.95	7/2/2012

Source: SERO ACL Monitoring Webpage [accessed 2/6/2018].

The relative effect of each trip limit sub-alternative under **Preferred Alternative 2** is depicted in **Figure 4.7.1.1**. The proposed trip limits have the expected effect of reducing the estimated landings of Other Jacks as the trip limit decreases from **Preferred Sub-alternative 2a** (500 lbs gw) to **Sub-alternative 2c** (300 lbs gw). Within each trip limit sub-alternative, imposition of a minimum size for almaco jack shows a decreasing pattern in the landings level as minimum size limits increase (**Figure 4.7.1.1**). Under a 26-inch minimum size limit, trip limits of 400 or 300 lbs (**Sub-alternatives 2b** and **2c**, respectively) would result in the commercial ACL not being fully harvested. Similarly, the combination of a 24-inch minimum size and a 300-pound trip limit (**Sub-alternative 2c**) would leave a portion of the ACL unharvested.

Table 4.7.1.2 contains predicted closure dates for the Other Jacks Complex for each of the trip limits under **Preferred Alternative 2**.

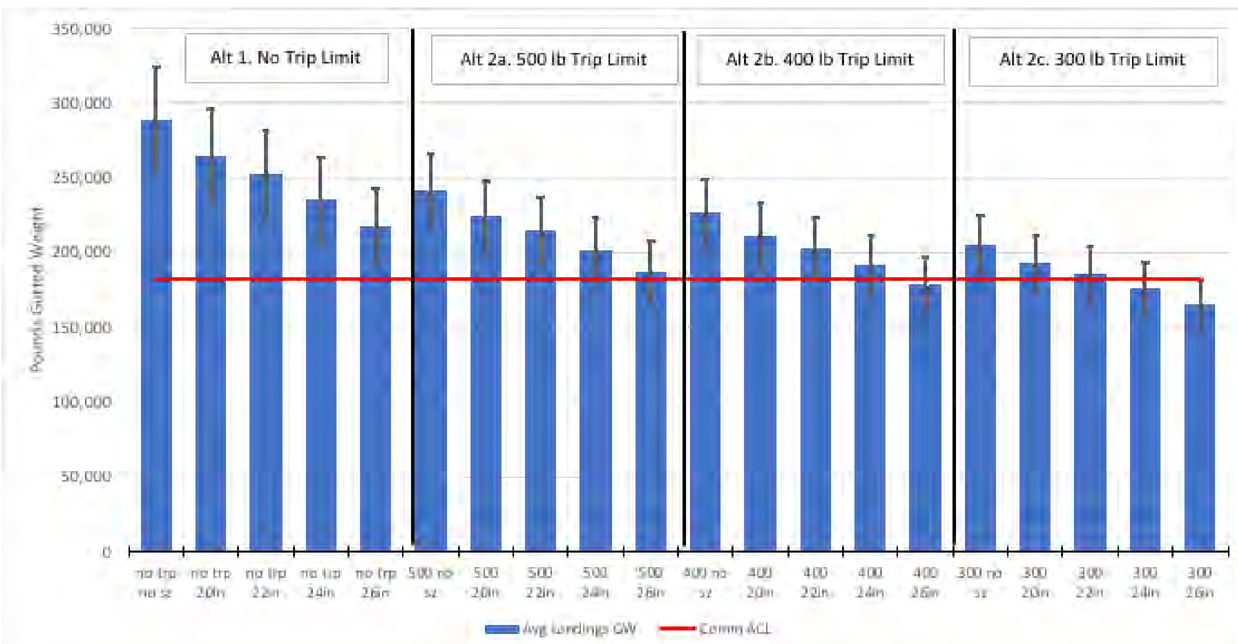

Figure 4.7.1.1. Estimated annual commercial landings of the Jacks Complex for **Sub-alternatives 2a (Preferred)-2c**. Each sub-alternative was analyzed for each of the almaco jack minimum size limit alternatives under Action 6. The commercial ACL for the Other Jacks complex is depicted by the red line.

Table 4.7.1.2 shows the estimated closure dates for each of the trip limit sub-alternatives under **Preferred Alternative 2**. Each of these sub-alternatives was analyzed in combination with the minimum size limits proposed under Action 6.

Table 4.7.1.2. Estimated closure dates for each trip limit sub-alternative under **Preferred Alternative 2** analyzed in combination with minimum size limits proposed under Action 6. Preferred alternatives indicated in bold.

Trip Limit Alt (Action 7)	Size Limit Alt (Action 6)	Closure Dates
2a (500 lbs)	1 (No size limit)	16-Aug
	2a (20 inches)	**14-Sep**
	2b (22 inches)	3-Oct
	2c (24 inches)	4-Nov
	2d (26 inches)	17-Dec
2b (400 lbs)	1 (No size limit)	9-Sep
	2a (20 inches)	11-Oct
	2b (22 inches)	1-Nov
	2c (24 inches)	6-Dec
	2d (26 inches)	No Closure
2c (300 lbs)	1 (No size limit)	28-Oct
	2a (20 inches)	2-Dec
	2b (22 inches)	20-Dec
	2c (24 inches)	No Closure
	2d (26 inches)	No Closure

Source: SAFMC

To help put predicted closure dates in perspective, the average monthly landings of Other Jacks for 2014-2016 were estimated using the logbook data, with 95% CI (**Figure 4.7.1.2**). The monthly landings show a clear pattern, or season, for Other Jacks that starts in April and is over by August. Landings occur over the rest of the year but at a much lower level. It should be noted that the 95% CI around these monthly estimates are very wide.

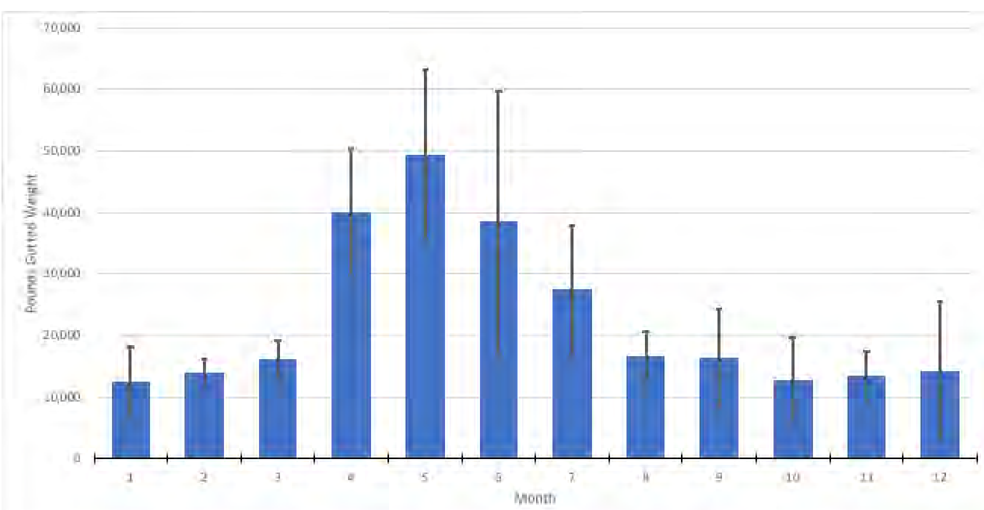

Figure 4.7.1.2. Average monthly commercial landings of Other Jacks with 95% CI, 2014-2016 (lbs ww).

Mean monthly estimates of commercial discards for the affected species in this amendment, including those in the Other Jacks Complex, from the SEFSC Supplemental Commercial Discard Logbook (accessed May 2017) are provided in **Table 4.1.1.3**. During 2014 through 2016, discard of species in the Other Jacks Complex (almaco jack, banded rudderfish, and lesser amberjack) were highest from August through October.

Biological effects of the implementing a trip limit for the Other Jacks Complex are expected to be neutral relative to **Alternative 1 (No Action)** since overall harvest would continue to be limited to the ACL and AMs would be triggered if the ACL was exceeded.

4.7.2 Economic Effects

Alternative 1 (No Action) would not specify a commercial trip limit for the other jacks complex. Under this alternative, the other jacks complex fishing season would be expected to close on July 2 (**Table 4.6.1.2**). This would result in foregone fishing opportunities later in the year.

Preferred Alternative 2 would specify a commercial trip limit for the other jacks complex that is fixed throughout the year at 500 pounds (lbs) gutted weight (gw) (**Preferred Sub-alternative 2a**), 400 lbs gw (**Sub-alternative 2b**), or 300 lbs gw (**Sub-alternative 2c**). Each incremental decrease in the trip limit would be expected to successively increase the season length for the other jacks complex by further reducing daily harvest rates (Table 4.7.1.2). Due to time constraints, the economic component of the forecast model is not yet complete. Estimates of aggregate annual ex-vessel revenue will be provided upon completion of the model along with a comparison of the alternatives. Aggregate annual estimates of landings and ex-vessel revenue would depend on the interaction of this action and **Action 6**, as under some combinations of alternatives, the season would not be expected to close.

By effectively lowering catch rates earlier in the year in exchange for a longer season, **Preferred Alternative 2** may benefit some vessels or fishing businesses in terms of increased access and negatively affect others in terms of lower trip-level landings. The magnitude of such effects would depend on the harvesting characteristics and profit maximization strategies of each vessel or fishing business. These types of individual economic effects cannot be quantified with existing data, but may be amplified by each incremental decrease in the commercial trip limit.

Negative biological impacts to other jacks stocks are not expected under **Preferred Alternative 2** because overall harvest would be constrained by the ACL (Section 4.7.1). However, unforeseen changes in discards as a result of commercial trip limits or temporal changes in fishing pressure could challenge this assumption and result in future reductions in allowable harvest levels and associated ex-vessel revenue. Also, shifts in targeting behavior as a result of this action could potentially have negative impacts on other commercially-important stocks. It is assumed that the likelihood of such indirect economic effects would be low.

4.7.3 Social Effects

A description of the communities that would most likely be affected by changes in commercial management of the Other Jacks can be found in **Section 3.4** and include: Islamorada, Palm Beach Gardens, Boca Raton, Daytona Beach, Miami, Delray Beach, and Marathon Shores, Florida; and Wilmington, Morehead City and Hampstead, North Carolina. These communities would likely be affected by changes to the commercial trip limit for the Other Jacks Complex.

In general, a commercial trip limit under **Preferred Alternatives 2** and **Alternative 3** may help slow the rate of harvest, lengthen the season, and prevent the ACL from being exceeded, but trip limits that are too low may make fishing trips inefficient and too costly if fishing grounds are too far away. A longer open season would be beneficial to the commercial fleet and to end users of jacks (restaurant owners, fish houses, and consumers) by improving consistency of availability.

Peak harvest of Other Jacks begins in April and concludes in August (**Figure 4.7.1.3**). When combined with the minimum size limit for almaco jack proposed in **Action 6/Preferred Sub-alternative 2a**, **Alternative 2/Sub-alternatives 2c** would keep the fishery open until the beginning of December. **Alternative 2/Preferred Sub-alternative 2a** would result in a shorter season with an estimated closure mid-September, after harvest of Other Jacks has peaked. Generally, longer fishing seasons provide continued access for commercial fishermen and consistency for end users, if trip limits are sufficient to support commercial fishing activity.

4.7.4 Administrative Effects

Alternative 1 (No Action) would not change the administrative environment from its current state. Currently, there is a commercial quota monitoring system in place for the Other Jacks Complex that is utilized to monitor landings against the commercial quota. From 2014 through 2016, the ACL for the Other Jacks Complex has been met from late June to early August (**Table 4.6.1.1**), which is prior to the end of the fishing year. If total effort in the fishery remains consistent, it is likely the fishery would require closures early due to reaching the ACL prior to the end of the fishing year. Therefore, fishery managers will have to continue to prepare and issue fishery closure notices. Additionally, enforcement personnel would have to monitor the closures. With an in-season quota closure, there is potential that the landings do not reach 100% of the ACL. In that circumstance, guidance from the SAFMC to NMFS recommended that the fishery should reopen if landings are less than 95% of the ACL, and the projected number of days that the fishery can reopen to meet the ACL is two or more days. Therefore, the fishery managers would have to monitor the landings and prepare a reopen notice.

Alternatives 2 and **3** would modify the commercial trip limit for species in the Other Jacks Complex. The sub-alternatives for **Alternatives 2** and **Alternative 3** would implement trip limits for the complex, which may slow the rate that landings would reach the ACL, and delay or potentially end the need for fishery managers to prepare a closure notice. This may slow the rate of landings even further and lengthen the season, which could potentially reduce the need for an in-season closure, than **Alternative 1 (No Action)** and **Alternative 2**. However, **Alternative 2**

would also implement trip limit reduction, which could potentially cause fishery managers to prepare a trip limit reduction notice and/or a closure notice.

Of the three alternatives considered for management of the Other Jacks Complex, **Alternative 2** would impose the most significant, direct administrative burden, followed by **Alternate 3**. Ongoing monitoring of the commercial quota would be required, and enforcement personnel would have to monitor trip limits. Over the course of a given fishing year, there is potential under **Alternative 2** for a total of three in-season notices (i.e., trip limit reduction, closure notice, and reopening notice) that would need to be prepared by fishery managers. Under **Alternative 3**, a potential closure and reopening notice would need to be prepared. . Outreach materials would take the form of fishery bulletins and updates to NOAA Fisheries Service Southeast Region's web site.

4.8 Action 8. Modify the seasonal prohibition on commercial harvest and possession of red grouper in the Exclusive Economic Zone off South Carolina and North Carolina

4.8.1 Biological Effects

The months of March-April were closed to gag and black grouper harvest in 1999 (SAFMC 1999). The January-April closure for all shallow-water groupers was implemented in 2009 (SAFMC 2009a). Thus, sale and purchase of red grouper was prohibited off North and South Carolina in 2009. The mean monthly percentage of annual red grouper landings 2006-2008 are shown in **Table 4.8.1.1**. January-April accounted for 20% of annual landings of red grouper off the Carolinas.

Red grouper spawn from February through June in the South Atlantic with a peak in April (**Table 3.2.1**). Fishermen have indicated, however, that red grouper harvested in May off North Carolina are frequently in spawning condition and there is concern that the current spawning season closure is not capturing the bulk of spawning activity for that species off North Carolina (SAFMC, port meetings 2014). Detailed information on the spatial distribution of red grouper spawning activity is needed to corroborate this information. While **Alternative 1 (No Action)** encompasses the bulk of red grouper spawning activity, alternatives that extend protection past April, the month of peak spawning in the region, would impart additional biological benefits to the stock. Hence, **Sub-alternatives 2a Preferred)-2c** are expected to result in similar levels of positive biological effects for red grouper off the Carolinas.

The analysis for this action required backfilling landings for the January-April closed time period. Assuming no temporal redistribution of effort, relative to this status quo closure, **Preferred Sub-alternative 2a** would eliminate an additional 12% of annual landings. **Sub-alternative 2b** would eliminate an additional 7% of annual landings. **Sub-alternative 2c** would eliminate an additional 17% of annual landings. The assumption that there will be no temporal redistribution of fishing effort appears substantiated by the SEFSC Commercial ACL data (accessed October 2017). **Figure 4.8.1.1** clearly shows that the elimination of four months of fishing substantially reduced the annual landings of red grouper off North and South Carolina, and this decline has persisted through time.

Mean monthly estimates of commercial discards for the affected species in this amendment, including shallow-water groupers, from the SEFSC Supplemental Commercial Discard Logbook (accessed May 2017) are provided in **Table 4.1.1.3**. From 2014 through 2016, discards of shallow-water grouper species were relatively low with no discernible peaks throughout the year. Small peaks in discards are present in May, at the very beginning of the commercial fishing year for this group of species, and November.

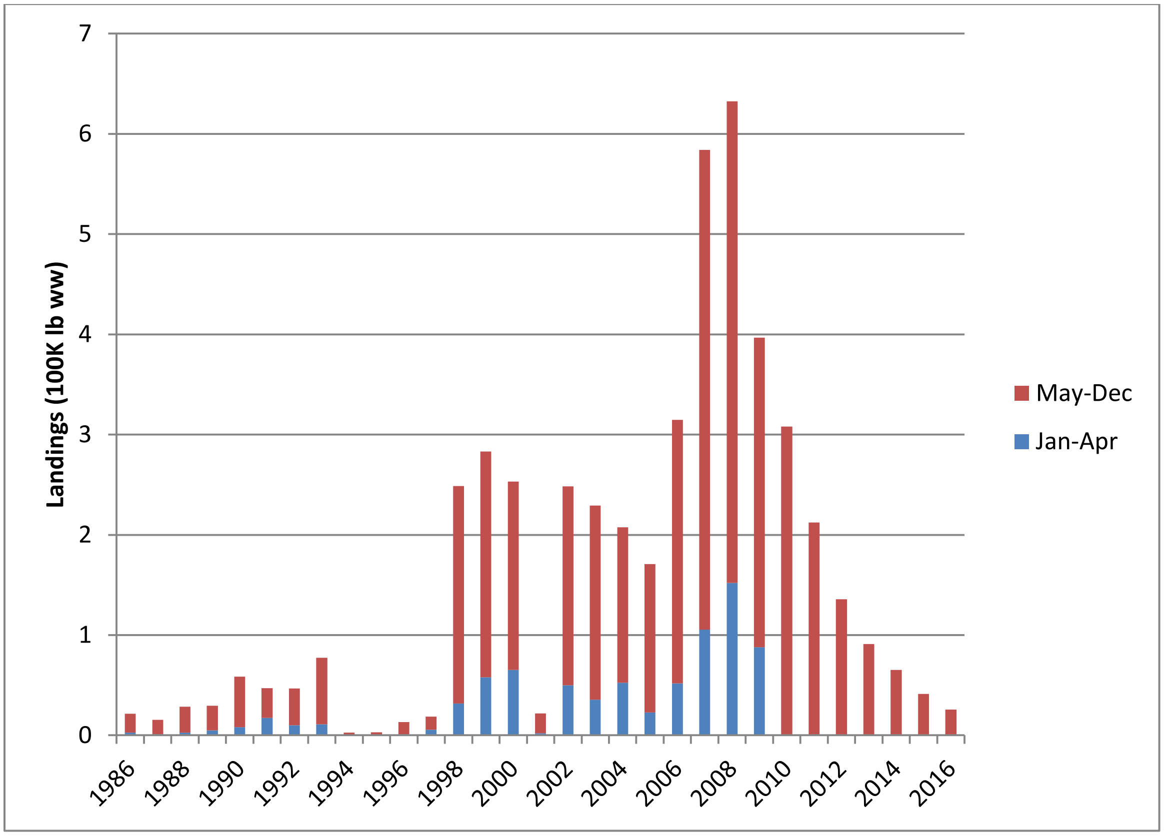

Figure 4.8.1.1. Commercial landings (100,000 pounds whole weight) of red grouper reported by dealers from North and South Carolina, before and after the January-April shallow-water grouper closure implementation in mid-2009.

Table 4.8.1.1. Total landings (lbs ww) and mean monthly percentage of commercially landed red grouper reported by dealers in South Carolina and North Carolina for the three years prior to the implementation of the January-April shallow-water grouper closure.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2006	15,880	11,320	10,481	14,237	33,499	36,301	35,635	44,558	32,216	29,058	27,289	24,203
2007	15,588	12,131	37,911	39,846	69,021	85,124	69,485	85,159	32,386	49,730	37,496	50,253
2008	41,456	38,306	29,155	43,194	86,630	99,013	60,623	73,510	43,316	53,222	36,007	28,080
Mean	24,308	20,586	25,849	32,426	63,050	73,479	55,248	67,742	35,973	44,003	33,597	34,179
	5%	4%	5%	6%	12%	14%	11%	13%	7%	9%	7%	7%

4.8.2 Economic Effects

Alternative 1 (No Action) will maintain the current January through April prohibition on the sale or purchase of shallow-water groupers harvested from or possessed in the South Atlantic EEZ. **Preferred Alternative 2** would modify the duration of the prohibition, specifically for red grouper, off of North Carolina and South Carolina. **Preferred Sub-alternative 2a** would increase the length of the prohibition for red grouper off of the Carolinas by one month (January through May). **Sub-alternatives 2b** and **2c** would not extend the duration of the prohibition for red grouper but would change the start and end dates of the prohibition to February through May or March through June, respectively. Due to time constraints, the economic component of the forecast model is not yet complete. Quantified estimates of economic effects will be provided, as available, upon completion of the model along with a comparison of the alternatives.

Increasing the duration of the red grouper prohibition or shifting the dates of the prohibition off of the Carolinas (**Preferred Sub-alternative 2a** and **Sub-alternatives 2b** and **2c**) would be expected to reduce landings of red grouper and, consequently, ex-vessel revenue as well (Section 4.8.1). In addition, changes in the open season for red grouper may have varying effects on individual harvesters that fish off of North Carolina and South Carolina. These would depend on each harvester's profit maximization strategy, their dependence on red grouper, their seasonal fishing behavior, and their ability to adapt to the changing regulations. Unfortunately, these individual-level economic effects cannot be quantified with available data.

Long-term indirect economic benefits in the form of greater future harvest rates and corresponding ex-vessel revenue would be expected to occur if the modified prohibition on red grouper off of North Carolina and South Carolina provides enhanced protection to spawning fish.

4.8.3 Social Effects

A description of the communities that would most likely be affected by changes in commercial management of shallow water snapper grouper species, including red grouper, can be found in **Section 3.4** and include: Murrells Inlet and Little River, South Carolina; and Morehead City, Wilmington, Southport, Surf City, and Hampstead, North Carolina. These communities would likely be affected by changes to the modifications of the seasonal prohibition on commercial harvest and possession of red grouper off of North Carolina and South Carolina.

The potential effects on commercial fishing businesses and coastal communities of modifying the red grouper closure will be a trade-off between the biological benefits of the seasonal closure and the increased commercial fishing opportunities if the closure is shortened. In general, a longer seasonal closure may be biologically beneficial to the stock and contribute to sustainable fishing opportunities in the future if the closure appropriately lines up with spawning, but a longer closure would be more likely to restrict access to red grouper.

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

4.8.4 Administrative Effects

Modifying the recreational seasonal prohibition of red grouper that would be different from the other shallow-water grouper species under **Alternative 2** and **Sub-alternatives 2a**, **2b**, and **2c** could be confusing to the public and add to the administrative burden in the form of cost, time, and law enforcement efforts compared to **Alternative 1 (No Action)**. Additionally, the public would have to be informed and educated on additional restrictions on harvest. **Sub-Alternative 2a** may be less confusing to the public since one month would be added to the current seasonal prohibition, while **Sub-Alternative 2b** and **2c** would shift the four-month seasonal prohibition entirely, compared to the other shallow-water grouper species.

4.9 Action 9. Remove the commercial minimum size limit for certain deep-water species

4.9.1 Biological Effects

> ***Alternatives****
>
> 1. No Action. The commercial minimum size limit for queen snapper, silk snapper, and blackfin snapper is 12 inches total length (TL).
>
> **2. Remove the 12-inch TL commercial minimum size limit for queen snapper, silk snapper, and blackfin snapper in South Atlantic federal waters.**
>
> * Preferred indicated in bold. Refer to Chapter 2 for detailed language of alternatives

The current commercial size limit of 12 inches total length (TL) for queen snapper, silk snapper, and blackfin snapper was established in Amendment 9 (SAFMC 1998). It was difficult to determine the effects of **Preferred Alternative 2** due to the lack of commercial discard data available. The only discard data available for the years 2014-2016 were from the SEFSC Supplemental Discard Logbook Program. The discard logbook database (accessed May 2017) contains self-reported discard data from a 20% sub-sample (by region and gear fished) of all commercial vessels with federal fishing permits (see **Appendix J** for detailed methodology). From 2014-2016, only two trips reported discards for silk snapper and no discards were reported for queen snapper or blackfin snapper (**Table 4.9.1.1**). None of the species were reported as being kept for bait. Among trips with reported discards for any of the three species, there were five silk snapper discarded alive due to being undersized. Even though the discard condition was reported as alive, it is likely that discard mortality is high. A literature search did not reveal any discard mortality studies specific to the species in this action, but other studies of commercially discarded red snapper have estimated discard mortality rates >50% beyond 60 meters (Campbell et al. 2014, Pulver 2017).

Expanding the observed discard rates to the fishery as a whole is non-informative due to low reported encounters in recent years (see **Table 4.1.1.3**). Available data suggest minimal changes in discard or harvest rates would be expected under **Preferred Alternative 2**. Thus, biological effects of **Preferred Alternative 2** would be neutral compared to **Alternative 1 (No Action)** as removing the size limit would have no effect on overall harvest, which is limited by the ACL and AMs are in place to prevent overages.

Table 4.9.1.1. Number of discards of queen, silk, and blackfin snapper reported to the coastal logbook program from 2014 through 2016 for the South Atlantic.

Species	Number Discarded	Discard Condition	Discard Reason
Queen Snapper	0	———	———
Silk Snapper	5	All Alive	Size Limit
Blackfin Snapper	0	———	———

4.9.2 Economic Effects

Alternative 1 (No Action) would maintain the current commercial minimum size limit (MSL) of 12 inches (in) total length (TL) for queen snapper, silk snapper, and blackfin snapper. **Preferred Alternative 2** would remove this MSL; however, based on available data, only minimal changes in discards or landings would be expected to occur (Section 4.9.1). Therefore any potential changes in ex-vessel revenue relative to the status quo would also be expected to be minimal. If in fact harvest rates increase noticeably as a result of **Preferred Alternative 2**, it could result in an overall increase in aggregate annual ex-vessel revenue relative to the status quo. Such an increase would be constrained, however, by the ACL for the deepwater complex. Quantified estimates of economic effects are not currently available.

Positive or negative long-term indirect economic effects could occur as a result of **Preferred Alternative 2**. These would depend on resultant changes in discards and spawning levels. Based on available data, the expectation is that such effects would be minimal.

4.9.3 Social Effects

A description of the communities that would most likely be affected by changes in commercial management of queen, silk and blackfin snapper can be found in **Section 3.4** and includes: Key West, Miami, Miami Beach , Key Largo, and Mayport, Florida; Murrells Inlet and Little River, South Carolina; and Southport, Beaufort, and Emerald Isle, North Carolina. These communities would likely be affected by changes to commercial size limits for deep-water species.

Some social effects of removing the minimum size limits from the deepwater species would be associated with the positive and negative biological effects on the species (see **Section 4.9.1**). Positive effects of removing the minimum size limit would result from reduced discards. This would be expected to reduce waste in the fishery, improving the perception of management success.

However, as discussed in **Section 4.9.1**, catch for queen, silk and blackfin snapper is generally at low levels. Removing the minimum size limit (**Preferred Alternative 2**) would likely have minimal or no effect on current commercial trips and are similar to the expected effects of **Alternative 1 (No Action)**, because these species are not caught in large numbers.

4.9.4 Administrative Effects

Beneficial administrative effects would be expected from **Alternative 2**, when compared with **Alternative 1 (No Action)**. Removing the minimum size limit for deep water species would create consistent regulations with other managed deep water species, which would help the public avoid confusion with regulations and aid law enforcement. Administrative impacts on the agency associated with the action alternatives would be incurred by rulemaking, outreach, education and enforcement. Because there is a minimum size limit already in place for these three deep water species in the South Atlantic Region under **Alternative 1 (No Action)**, removing the minimum size limit under **Alternatives 2** would not be unusually burdensome.

4.10 Action 10. Reduce the commercial minimum size limit for gray triggerfish in the Exclusive Economic Zone off east Florida

4.10.1 Biological Effects

The South Atlantic Council recently modified the gray triggerfish minimum size limit for the commercial sector in federal waters off the east coast of Florida in Amendment 29 (SAFMC 2014), effective July 1, 2015. The amendment raised the minimum size limit in federal waters off the east coast of Florida from 12 inches total length (TL) to 14 inches fork length (FL). To evaluate the effects of lowering the current minimum size limit, commercial catch data collected by the Southeast Fisheries Science Center's (SEFSC) Trip Intercept Program (TIP) prior to the current rule were used to determine potential impacts. Only gray triggerfish harvested from January 2014 through June 2015 by the commercial sector in federal waters off east Florida were used in the analyses. For detailed methodology of the analysis refer to **Appendix J**.

> ***Alternatives****
>
> 1. No Action. The commercial minimum size limit for gray triggerfish in federal waters off east Florida is 14 inches fork length (FL). The commercial minimum size limit for gray triggerfish in federal waters off Georgia, South Carolina, and North Carolina is 12 inches FL.
>
> **2. Reduce the commercial minimum size limit for gray triggerfish off east Florida to 12 inches FL.**
>
> * Preferred indicated in bold. Refer to Chapter 2 for detailed language of alternatives

Figure 4.10.1.1 shows gray triggerfish length distribution in 1-inch increments from January 2014 to June 2015 for the commercial sector in federal waters off east Florida. The majority of the gray triggerfish harvested were above the current minimum size limit of 14 inches FL **(Alternative 1 (No Action))**. Lowering the current size limit to 12 inches FL (**Preferred Alternative 2**) would result in approximately 20% additional gray triggerfish available for harvest. This is consistent with recent analyses from Amendment 29 (SAFMC 2014) that reported between 11% and 26% of the mean monthly landings in federal waters off east Florida were less than 14 inches FL in the South Atlantic from 2007 through 2012. **Alternative 2** would also likely reduce discards during the open months; however, harvest rates could also increase possibly shortening the commercial fishing seasons. In-season closures have been implemented for gray triggerfish every year since 2012 (**Table 4.10.1.1**).

Table 4.10.1.1. Total commercial landings of gray triggerfish (lbs ww) and closure dates, 2012-2017.

Fishing Year	Fishing Season	Total Landings	ACL		Quota %	Closure Date
2017	Jan 1 - June 30	135,884	156,162		87.01	
	July 1 - Dec 31	189,189	176,440*		107.23*	11/8/17
2016	Jan 1 - June 30	134,733	156,162		86.28	4/2/16; reopened 6/13/16
	July 1 - Dec 31	146,142	172,178		84.88	12/16/16
2015	Jan 1 - June 30	223,462	272,880		81.89	5/8/15
	July 1 - Dec 31	88,754	63,918		138.86	9/8/15
2014	Jan 1 - Dec 31	262,838	272,880		96.32	5/12/14
2013		329,837	272,880		120.87	7/7/2013
2012		317,146	305,262		103.89	9/11/12; Re-opened

						12/12/12-12/19/12

Source: SERO ACL monitoring website [accessed 2/6/2018].
*unused portion of the quota from the January 1 through June 30 season was added to the July 1 through December 31 quota.

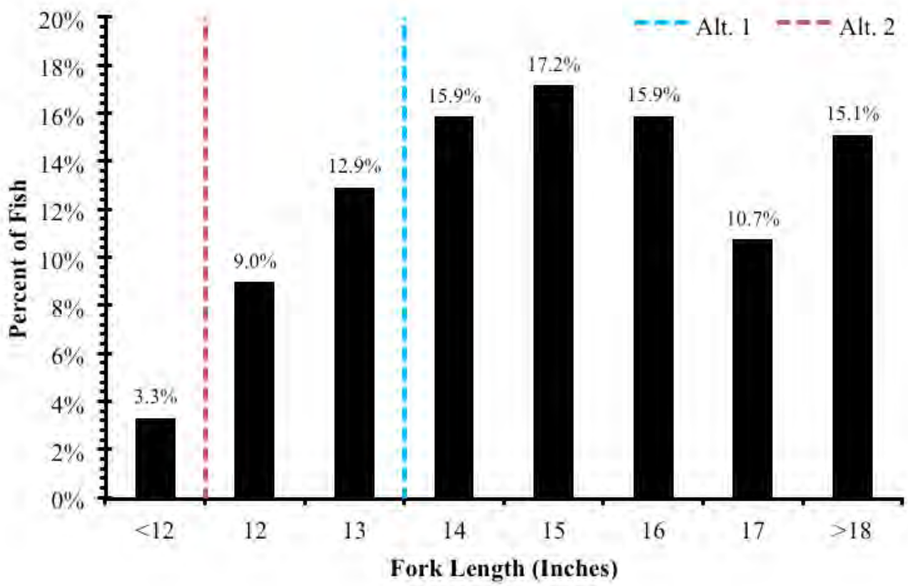

Figure 4.10.1.1. Length distribution of gray triggerfish (inches fork length) caught in federal waters off east Florida generated from commercial TIP (n=2,616) data from January 2014 to June 2015. Dashed lines denote the commercial minimum size limit proposed in each alternative.
Source: SERO

Similar to the length distribution, lowering the size limit to 12 inches FL would increase the rate of harvest, thus increasing landings and possibly shortening the current commercial seasons (**Table 4.10.1.2**). The reliability of this analysis is dependent upon the accuracy of the underlying data and input assumptions. This analysis assumes that the size distribution of the commercial harvest of gray triggerfish from January 2014 to June 2015 will reflect the size distribution of gray triggerfish commercial harvest in the future.

Table 4.10.1.2. Estimated percent increase in whole weight of commercial gray triggerfish landings in federal waters off east Florida at 1-inch intervals between 12-14 inches fork length (FL). The increases were generated with TIP data from January 2014 to June 2015 from a sample of 2,616 fish.

Minimum Size Limit (inches FL)	Percent Increase
12	19.7
13	12.5
14	0.0

The biological effects of **Preferred Alternative 2** could be negative even with overall harvest limited to the ACL and with AMs in place to prevent overages. The reduction in discarded fish during the open months may have minimal impact due to the low discard mortality of 12.5% estimated in SEDAR 41 (2016) and the loss in egg production. However, a decrease in the size limit, as proposed under **Preferred Alternative 2**, could have negative biological effects if larger fish produce more eggs. The length at 50% maturity (L50) in SEDAR 41 (2016) was estimated at 177 mm (7 inches) for female gray triggerfish. Based on equations in SEDAR 41 for length-age relationship (Von Bertalanffy equation) and egg production at age, a 12-inch gray triggerfish female produces about half the number of eggs as a 14-inch fish.

Mean monthly estimates of commercial discards for the affected species in this amendment, including gray triggerfish, from the SEFSC Supplemental Commercial Discard Logbook (accessed May 2017) are provided in **Table 4.1.1.3**. From 2014 through 2016, discards of gray triggerfish in the commercial fishery were highest from July through September.

4.10.2 Economic Effects

Alternative 1 (No Action) would maintain the current commercial minimum size limit (MSL) for gray triggerfish of 14 inches (in) fork length (FL) in federal waters off east Florida and 12 in FL in federal waters off of Georgia, South Carolina, and North Carolina. **Preferred Alternative 2** would reduce the MSL for gray triggerfish in federal waters off east Florida from 14 in FL to 12 in FL. The MSL in the other South Atlantic states would remain at 12 in FL under this alternative.

Preferred Alternative 2 would be expected to increase landings rates on average by about 20% and would likely result in a shorter gray triggerfish season than under the status quo (**Table 4.10.1.2**). Due to time constraints, the economic component of the forecast model is not yet complete. Estimates of aggregate annual ex-vessel revenue will be provided upon completion. However, it is expected that the ACL would be fully achieved under all of the alternatives and so there will likely be little difference in aggregate annual ex-vessel revenue across alternatives. Increasing catch rates but shortening the season may benefit some vessels and fishing businesses in terms of greater harvesting efficiency earlier in the year, but may also negatively affect others due to decreased access later in the year. These effects would depend on a variety of factors, including vessel harvesting characteristics and profit maximization strategies, and cannot be quantified with available data.

Reducing the MSL may have long-term positive or negative indirect economic effects. These would depend on the extent to which discards decrease as well as the ability of the MSL to protect the spawning potential of the stock. If the stock is negatively affected by this action, it could result in lower future catch rates and ex-vessel revenue.

4.10.3 Social Effects

A description of the communities that would most likely be affected by changes in commercial management of gray triggerfish can be found in **Section 3.4**. and includes: Mayport, and Saint Augustine, Florida; Murrells Inlet, Little River, Charleston and McClellanville, South Carolina; and Oak Island, Beaufort, Morehead City, and Southport, North Carolina.

Some social effects of minimum size limits would be associated with the biological effects on gray triggerfish (**Section 4.10.1**). Additionally, there is a trade-off with reducing the minimum size limit in that an increase in the number of fish that can be kept may improve commercial trip profitability but may also increase the harvest rate and trigger accountability measures if landings reach the ACL sooner in the fishing year.

The rate of harvest is anticipated to increase under the proposed minimum size limit in **Preferred Alternative 2** when compared to the minimum size limit in **Alternative 1 (No Action)** (**Table 4.10.1.2**). The accountability measure for gray triggerfish is an in-season closure for the whole South Atlantic, which extends the potential negative effects of **Preferred Alternative 2** to all commercial fishermen targeting gray triggerfish. The benefits and costs to commercial fishermen would depend on the balance of increasing the number of fish that can be kept while ensuring that an increased harvest rate would not result in a shortened commercial season.

Reducing the minimum size limit (**Preferred Alternative 2**) may benefit Florida commercial fishermen by increasing the number of fish that can be kept, which may increase trip profitability. **Preferred Alternative 2** would also make the minimum size limit consistent for all South Atlantic states and be expected to reduce the number of discards.

4.10.4 Administrative Effects

Beneficial administrative effects would be expected from **Alternative 2**, when compared with **Alternative 1** (**No Action**). Alternatives that specify a consistent minimum size limits in state and federal waters throughout the South Atlantic Council's jurisdiction would help the public avoid confusion with regulations and aid law enforcement. Administrative impacts on the agency associated with the action alternatives would be incurred by rulemaking, outreach, education and enforcement.

Chapter 5. Council's Choice for the Preferred Alternatives

To be completed after all actions are approved in June

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

5.1.4 Public Comments and Recommendations

5.1.5 South Atlantic Council's Conclusion

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

5.2 Action 2.

5.2.1 Snapper Grouper Advisory Panel (AP) Comments and Recommendations

5.2.2 Law Enforcement AP Comments and Recommendations

5.2.3 Scientific and Statistical Committee (SSC) Comments and Recommendations

5.2.4 Public Comments and Recommendations

5.2.5 South Atlantic Council's Conclusion

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

5.3 Action 3.

5.3.1 Snapper Grouper Advisory Panel (AP) Comments and Recommendations

5.3.2 Law Enforcement AP Comments and Recommendations

5.3.3 Scientific and Statistical Committee (SSC) Comments and Recommendations

5.3.4 Public Comments and Recommendations

5.3.5 South Atlantic Council's Conclusion

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

5.4 Action 4.

5.4.1 Snapper Grouper Advisory Panel (AP) Comments and Recommendations

5.4.2 Law Enforcement AP Comments and Recommendations

5.4.3 Scientific and Statistical Committee (SSC) Comments and Recommendations

5.4.4 Public Comments and Recommendations

5.4.5 South Atlantic Council's Conclusion

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

5.5 Action 5.

5.5.1 Snapper Grouper Advisory Panel (AP) Comments and Recommendations

5.5.2 Law Enforcement AP Comments and Recommendations

5.5.3 Scientific and Statistical Committee (SSC) Comments and Recommendations

5.5.4 Public Comments and Recommendations

5.5.5 South Atlantic Council's Conclusion

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

5.6 Action 6.

5.6.1 Snapper Grouper Advisory Panel (AP) Comments and Recommendations

5.6.2 Law Enforcement AP Comments and Recommendations

5.6.3 Scientific and Statistical Committee (SSC) Comments and Recommendations

5.6.4 Public Comments and Recommendations

5.6.5 South Atlantic Council's Conclusion

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

5.7 Action 7.

5.7.1 Snapper Grouper Advisory Panel (AP) Comments and Recommendations

5.7.2 Law Enforcement AP Comments and Recommendations

5.7.3 Scientific and Statistical Committee (SSC) Comments and Recommendations

5.7.4 Public Comments and Recommendations

5.7.5 South Atlantic Council's Conclusion

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

5.8 Action 8.

5.8.1 Snapper Grouper Advisory Panel (AP) Comments and Recommendations

5.8.2 Law Enforcement AP Comments and Recommendations

5.8.3 Scientific and Statistical Committee (SSC) Comments and Recommendations

5.8.4 Public Comments and Recommendations

5.8.5 South Atlantic Council's Conclusion

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

5.9 Action 9.

5.9.1 Snapper Grouper Advisory Panel (AP) Comments and Recommendations

5.9.2 Law Enforcement AP Comments and Recommendations

5.9.3 Scientific and Statistical Committee (SSC) Comments and Recommendations

5.9.4 Public Comments and Recommendations

5.9.5 South Atlantic Council's Conclusion

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

5.10 Action 10.

5.9.1 Snapper Grouper Advisory Panel (AP) Comments and Recommendations

5.9.2 Law Enforcement AP Comments and Recommendations

5.9.3 Scientific and Statistical Committee (SSC) Comments and Recommendations

5.9.4 Public Comments and Recommendations

5.9.5 South Atlantic Council's Conclusion

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

Chapter 6. Cumulative Effects

To be completed

Chapter 7. List of Interdisciplinary Plan Team (IPT) Members

Name	Agency/Division	Title
Brian Cheuvront	SAFMC	Deputy Executive Director
Myra Brouwer	SAFMC	IPT Lead/Fishery Biologist
Kari McLauchlin	SAFMC	Social Scientist
John Hadley	SAFMC	Fishery Economist
Roger Pugliese	SAFMC	Senior Fishery Biologist
Mike Errigo	SAFMC	Data analyst
Mary Vara	SERO/SF	IPT Lead/Fishery Biologist
Rick DeVictor	SERO/SF	South Atlantic Branch Chief
Adam Bailey	SERO/SF	Technical Writer and Editor
Nick Farmer	SERO/SF	Data Analyst
Mike Travis	SERO/SF	Economist
Jeff Pulver	SERO/SF	Data Analyst
Nikhil Mehta	SERO/SF	Fishery Biologist/NEPA
Mike Jepson	SERO/SF	Social Scientist
Mary Wunderlich	SERO/PR	Fishery Biologist
David Dale	SERO/HC	EFH Specialist
Noah Silverman	NMFS/SER	Regional NEPA Coordinator
Monica Smit-Brunello	NOAA GC	General Counsel
TBD (Tracy Dunn)	SERO/OLE	Criminal Investigator
Larry Perruso	SEFSC	
Erik Williams	SEFSC	

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

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

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

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

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Appendix A. Considered But Rejected Alternatives

Update

Action 1. Establish a commercial split season and modify the commercial trip limit for blueline tilefish

Alternative 3. Specify two commercial fishing seasons for blueline tilefish. Allocate the blueline tilefish commercial ACL into two quotas: XX% to the period January 1 through ______ and YY% to the period ____ through December 31. Any remaining quota from Season One would transfer to Season Two. Any remaining quota from Season Two would not be carried forward.

Discussion:

Action 4. Establish a commercial split season and modify commercial trip limit for red porgy

Alternative 2. Maintain the annual January 1 to April 30 seasonal harvest limit for red porgy.

> **Sub-Alternative 2a.** Allocate the directed commercial red porgy ACL into two quotas: 50% to the period January 1 through June 30 and 50% to the period July 1 through December 31. Any remaining quota from Season One would transfer to Season Two. Any remaining quota from Season Two would not be carried forward.
>
> **Sub-alternative 2b.** Allocate the directed commercial red porgy ACL into two quotas: XX% to the period January 1 through ______ and YY% to the period ____ through December 31. Any remaining quota from Season One would transfer to Season Two. Any remaining quota from Season Two would not be carried forward.

Discussion:

Action 6. Implement a commercial trip limit for the Other Jacks Complex

Alternative 3. Establish a commercial trip limit for almaco jack only.

> **Sub-alternative 3a.** 500 pounds gutted weight
> **Sub-alternative 3b.** 400 pounds gutted weight
> **Sub-alternative 3c.** 300 pounds gutted weight

Discussion:

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 regulatory amendment.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Overfishing: Overfishing occurs when a stock or stock complex is subjected to a rate of fishing mortality that exceeds the maximum fishing mortality threshold (e.g., current fishing mortality rate > MFMT = overfishing).
Quota: % or annual amount of fish that can be harvested.

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

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

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

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

South Atlantic Fisheries Management Council (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

South Atlantic Snapper Grouper History of Management
Last Updated: 2/16/17

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

*Shaded rows indicate FMP Amendments

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
FMP (1983)	08/31/83	PR: 48 FR 26843 FR: 48 FR 39463	-12" total length (TL) limit – red snapper, yellowtail snapper, red grouper, Nassau grouper; -8" limit – black sea bass; -4" trawl mesh size; -Gear limitations – poisons, explosives, fish traps, trawls; -Designated modified habitats or artificial reefs as Special Management Zones (SMZs).
Regulatory Amendment #1 (1987)	03/27/87	PR: 51 FR 43937 FR: 52 FR 9864	-Prohibited fishing in SMZs except with hand-held hook-and-line and spearfishing gear; -Prohibited harvest of goliath grouper in SMZs.
Amendment #1 (1988a)	01/12/89	PR: 53 FR 42985 FR: 54 FR 1720	-Prohibited trawl gear to harvest fish south of Cape Hatteras, NC and north of Cape Canaveral, FL; -Directed fishery defined as vessel with trawl gear and ≥200 lb s-g on board; -Established rebuttable assumption that vessel with s-g on board had harvested such fish in the exclusive economic zone (EEZ).
Regulatory Amendment #2 (1988b)	03/30/89	PR: 53 FR 32412 FR: 54 FR 8342	-Established 2 artificial reefs off Ft. Pierce, FL as SMZs.
Emergency Rule	8/3/90	55 FR 32257	-Added wreckfish to the fishery management unit (FMU); -Fishing year beginning 4/16/90; -Commercial quota of 2 million pounds; -Commercial trip limit of 10,000 pounds per trip.
Fishery Closure Notice	8/8/90	55 FR 32635	- Fishery closed because the commercial quota of 2 million pounds was reached.
Notice of Control Date	09/24/90	55 FR 39039	-Anyone entering federal wreckfish fishery in the EEZ off S. Atlantic states after 09/24/90 was not assured of future access if limited entry program developed.
Regulatory Amendment #3 (1989)	11/02/90	PR: 55 FR 28066 FR: 55 FR 40394	-Established artificial reef at Key Biscayne, FL as SMZ; -Fish trapping, bottom longlining, spear fishing, and harvesting of Goliath grouper prohibited in SMZ.

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
Amendment #2 (1990a)	10/30/90	PR: 55 FR 31406 FR: 55 FR 46213	-Prohibited harvest/possession of goliath grouper in or from the EEZ; -Defined overfishing for goliath grouper and other species.
Emergency Rule Extension	11/1/90	55 FR 40181	-Extended the measures implemented via emergency rule on 8/3/90.
Amendment #3 (1990b)	01/31/91	PR: 55 FR 39023 FR: 56 FR 2443	-Added wreckfish to the FMU; -Defined optimum yield (OY) and overfishing; -Required permit to fish for, land or sell wreckfish; -Required catch and effort reports from selected, permitted vessel; -Established control date of 03/28/90; -Established a fishing year for wreckfish starting April 16; -Established a process to set annual quota, with initial quota of 2 million pounds; provisions for closure; -Established 10,000 pound trip limit; -Established a spawning season closure for wreckfish from January 15 to April 15; -Provided for annual adjustments of wreckfish management measures.
Notice of Control Date	07/30/91	56 FR 36052	-Anyone entering federal snapper grouper fishery (other than for wreckfish) in the EEZ off S. Atlantic states after 07/30/91 was not assured of future access if limited entry program developed.
Amendment #4 (1991)	01/01/92	PR: 56 FR 29922 FR: 56 FR 56016	-Prohibited gear: fish traps except black sea bass traps north of Cape Canaveral, FL; entanglement nets; longline gear inside 50 fathoms; bottom longlines to harvest wreckfish; powerheads and bangsticks in designated SMZs off S. Carolina. -Defined overfishing/overfished and established rebuilding timeframe: red snapper and groupers ≤ 15 years (year 1 = 1991); other snappers, greater amberjack, black sea bass, red porgy ≤ 10 years (year 1 = 1991); -Required permits (commercial & for-hire) and specified data collection regulations; -Established an assessment group and annual adjustment procedure (framework); -Permit, gear, and vessel id requirements specified for black sea bass traps; -No retention of snapper grouper spp. caught in other fisheries with gear prohibited in snapper grouper fishery if captured snapper grouper had no bag limit or harvest was prohibited. If had a bag limit, could retain only the bag limit; -8" TL limit – lane snapper; -10" TL limit – vermilion snapper (recreational only); -12" TL limit – red porgy, vermilion snapper (commercial only), gray, yellowtail, mutton,

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
			schoolmaster, queen, blackfin, cubera, dog, mahogany, and silk snappers; -20" TL limit – red snapper, gag, and red, black, scamp, yellowfin, and yellowmouth groupers; -28" fork length (FL) limit – greater amberjack (recreational only); -36" FL or 28" core length – greater amberjack (commercial only); -Bag limits – 10 vermilion snapper, 3 greater amberjack -Aggregate snapper bag limit – 10/person/day, excluding vermilion snapper and allowing no more than 2 red snappers; -Aggregate grouper bag limit – 5/person/day, excluding Nassau and goliath grouper, for which no retention (recreational & commercial) is allowed; -Spawning season closure – commercial harvest greater amberjack > 3 fish bag prohibited in April; -Spawning season closure – commercial harvest mutton snapper >snapper aggregate prohibited during May and June; -Charter/headboats and excursion boat possession limits extended.
Amendment #5 (1992a)	04/06/92	PR: 56 FR 57302 FR: 57 FR 7886	For wreckfish: -Established limited entry system with individual transferable quotas (ITQs); -Required dealer to have permit; -Rescinded 10,000 lb. trip limit; -Required off-loading between 8 am and 5 pm; -Reduced occasions when 24-hour advance notice of offloading required for off-loading; -Established procedure for initial distribution of percentage shares of total allowable catch (TAC).
Emergency Rule	8/31/92	57 FR 39365	For Black Sea Bass (bsb): -Modified definition of bsb pot; -Allowed multi-gear trips for bsb; -Allowed retention of incidentally-caught fish on bsb trips.
Emergency Rule Extension	11/30/92	57 FR 56522	For Black Sea Bass: -Modified definition of bsb pot; -Allowed multi-gear trips for bsb; -Allowed retention of incidentally-caught fish on bsb trips.
Regulatory Amendment #4 (1992b)	07/06/93	FR: 58 FR 36155	-For Black Sea Bass: -Modified definition of bsb pot; -Allowed multi-gear trips for bsb; -Allowed retention of incidentally-caught fish on bsb trips.

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
Regulatory Amendment #5 (1992c)	07/31/93	PR: 58 FR 13732 FR: 58 FR 35895	-Established 8 SMZs off South Carolina, where only hand-held, hook-and-line gear and spearfishing (excluding powerheads) was allowed.
Amendment #6 (1993)	07/27/94	PR: 59 FR 9721 FR: 59 FR 27242	-Set up separate commercial TAC levels for golden tilefish and snowy grouper; -Established commercial trip limits for snowy grouper, golden tilefish, speckled hind, and warsaw grouper; -Included golden tilefish in grouper recreational aggregate bag limits; -Prohibited sale of warsaw grouper and speckled hind; -100% logbook coverage upon renewal of permit; -Creation of the *Oculina* Experimental Closed Area; -Data collection needs specified for evaluation of possible future individual fishing quota system.
Amendment #7 (1994a)	01/23/95	PR: 59 FR 47833 FR: 59 FR 66270	-12" FL – hogfish; -16" TL – mutton snapper; -Required dealer, charter and headboat federal permits; -Allowed sale under specified conditions; -Specified allowable gear and made allowance for experimental gear; -Allowed multi-gear trips in NC; -Added localized overfishing to list of problems and objectives; -Adjusted bag limit and crew specs. for charter and head boats; -Modified management unit for scup to apply south of Cape Hatteras, NC; -Modified framework procedure.
Regulatory Amendment #6 (1994b)	05/22/95	PR: 60 FR 8620 FR: 60 FR 19683	-Established actions which applied only to EEZ off Atlantic coast of FL: Bag limits – 5 hogfish/person/day (recreational only), 2 cubera snapper/person/day > 30" TL; 12" TL – gray triggerfish.
Notice of Control Date	04/23/97	62 FR 22995	-Anyone entering federal black sea bass pot fishery off South Atlantic states after 04/23/97 was not assured of future access if limited entry program developed.
Interim Rule Request	1/16/98		-The South Atlantic Fishery Management Council (Council) requested all Amendment 9 measures except black sea bass pot construction changes be implemented as an interim request under the Magnuson-Stevens Act.
Action Suspended	5/14/98		-NMFS informed the Council that action on the interim rule request was suspended.
Emergency Rule Request	9/24/98		-Council requested Amendment 9 be implemented via emergency rule.
Amendment #8 (1997)	12/14/98	PR: 63 FR 1813 FR: 63 FR 38298	-Established program to limit initial eligibility for snapper grouper fishery: -Must have demonstrated landings of any species in the snapper grouper FMU in 1993, 1994, 1995 or 1996;

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

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

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

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Amendment #9 (1998b) resubmitted	10/13/00	PR: 63 FR 63276 FR: 65 FR 55203	-Commercial trip limit for greater amberjack.
Amendment #13A (2003)	04/26/04	PR: 68 FR 66069 FR: 69 FR 15731	-Extended for an indefinite period the regulation prohibiting fishing for and possessing snapper grouper species within the *Oculina* Experimental Closed Area.
Notice of Control Date	10/14/05	70 FR 60058	-Considered management measures to further limit participation or effort in the commercial fishery for snapper grouper species (excluding wreckfish).
Amendment #13C (2006)	10/23/06	PR: 71 FR 28841 FR: 71 FR 55096	-End overfishing of snowy grouper, vermilion snapper, black sea bass, and golden tilefish. Increase allowable catch of red porgy. Year 1 = 2006; 1. Snowy Grouper Commercial: -Quota = 151,000 lb gutted weight (gw) in year 1, 118,000 lb gw in year 2, and 84,000 lb gw in year 3 onwards. -Trip limit = 275 lb gw in year 1, 175 lb gw in year 2, and 100 lb gw in year 3 onwards; Recreational: -Limit possession to one snowy grouper in 5 grouper per person/day aggregate bag limit; 2. Golden Tilefish Commercial: Quota of 295,000 lb gw, 4,000 lb gw trip limit until 75% of the quota is taken when the trip limit is reduced to 300 lb gw. Do not adjust the trip limit downwards unless 75% is captured on or before September 1; Recreational: Limited possession to 1 golden tilefish in 5 grouper per person/day aggregate bag limit; 3. Vermilion Snapper Commercial: Quota of 1,100,000 lb gw; Recreational: 12" TL size limit. 4. Black Sea Bass Commercial: Quota of 477,000 lb gw in year 1, 423,000 lb gw in year 2, and 309,000 lb gw in year 3 onwards; -Required use of at least 2" mesh for the entire back panel of black sea bass pots effective 6 months after publication of the final rule; -Required black sea bass pots be removed from the water when the quota is met; -Changed fishing year from calendar year to June 1 – May 31; Recreational: Recreational allocation of 633,000 lb gw in year 1, 560,000 lb gw in year 2, and 409,000 lb gw

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			in year 3 onwards. Increase minimum size limit from 10” to 11” in year 1 and to 12” in year 2; -Reduced recreational bag limit from 20 to 15 per person per day; -Changed fishing year from the calendar year to June 1 through May 31. 5. Red Porgy Commercial and recreational: -Retained 14” TL size limit and seasonal closure (retention limited to the bag limit); -Specified a commercial quota of 127,000 lb gw and prohibit sale/purchase and prohibit harvest and/or possession beyond the bag limit when quota is taken and/or during January through April; -Increased commercial trip limit from 50 lb ww to 120 red porgy (210 lb gw) during May through December;- -Increased recreational bag limit from one to three red porgy per person per day.
Notice of Control Date	3/8/07	72 FR 60794	-Considered measures to limit participation in the snapper grouper for-hire sector.
Amendment #14 (2007)	2/12/09	PR: 73 FR 32281 FR: 74 FR 1621	-Established eight deepwater Type II marine protected areas (MPAs) to protect a portion of the population and habitat of long-lived deepwater snapper grouper species.
Amendment #15A (2008a)	3/14/08	73 FR 14942	- Established rebuilding plans and status determination criteria for snowy grouper, black sea bass, and red porgy.
Notice of Control Date	12/4/08	74 FR 7849	-Established a control date for the golden tilefish portion of the snapper grouper fishery in the South Atlantic.
Notice of Control Date	12/4/08	74 FR 7849	-Established control date for black sea bass pot sector in the South Atlantic.
Amendment #15B (2008b)	2/15/10	PR: 74 FR 30569 FR: 74 FR 58902	-Prohibited the sale of snapper-grouper harvested or possessed in the EEZ under the bag limits and prohibited the sale of snapper-grouper harvested or possessed under the bag limits by vessels with a Federal charter vessel/headboat permit for South Atlantic snapper-grouper were harvested; -Reduced the effects of incidental hooking on sea turtles and smalltooth sawfish; -Adjusted commercial permit renewal periods and transferability requirements; -Revised the management reference points for golden tilefish; -Implemented plan to monitor and assess bycatch; -Required a vessel that fished in the EEZ, if selected by NMFS, to carry an observer and install electronic logbook and/or video monitoring equipment provided by NMFS; -Established reference points for golden tilefish;

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			-Established allocations for snowy grouper (95% commercial & 5% recreational); -Established allocations for red porgy (50% commercial & 50% recreational).
Amendment #16 (2009a)	7/29/09	PR: 74 FR 6297 FR: 74 FR 30964	-Specified status determination criteria for gag and vermilion snapper; For gag: -Specified interim allocations 51% commercial & 49% recreational; -Recreational and commercial shallow-water grouper spawning closure January through April; -Directed commercial quota= 352,940 lb gw; -Reduced 5-fish aggregate grouper bag limit, including tilefish species, to a 3-fish aggregate; -Captain and crew on for-hire trips cannot retain the bag limit of vermilion snapper and species within the 3-fish grouper aggregate; For vermilion snapper: -Specified interim allocations 68% commercial & 32% recreational; -Directed commercial quota split Jan-June=315,523 lb gw and 302,523 lb gw July-Dec; -Reduced bag limit from 10 to 4 and a recreational closed season November through March; -Required venting and dehooking tools when catching snapper grouper species to reduce recreational and commercial bycatch mortality.
Amendment #19 Comprehensive Ecosystem-Based Amendment 1 (CE-BA1) (2009b)	7/22/10	PR: 75 FR 14548 FR: 75 FR 35330	-Amended coral, coral reefs, and live/hardbottom habitat FMP to establish deepwater coral HAPCs; -Created a "shrimp fishery access area" (SFAA) within the Stetson-Miami Terrace CHAPC boundaries; -Created allowable "golden crab fishing areas" with the Stetson-Miami Terrace CHAPC and Pourtales Terrace CHAPC boundaries; -Amended the golden crab FMP to require vessel monitoring.
Amendment #17A (2010a)	12/3/10 red snapper closure; circle	PR: 75 FR 49447 FR: 75 FR 76874	-Required use of non-stainless steel circle hooks when fishing for snapper grouper species with hook-and-line gear north of 28 deg. N latitude in the South Atlantic EEZ;

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	hooks 3/3/2011		-Specified an annual catch limit (ACL) and an accountability measure (AM) for red snapper with management measures to reduce the probability that catches will exceed the stocks' ACL; -Specified a rebuilding plan for red snapper; -Specified status determination criteria for red snapper; -Specified a fishery-independent monitoring program for red snapper. -Implemented an area closure for snapper-grouper species.
Emergency Rule	12/3/10	75 FR 76890	-Delayed the effective date of the area closure for snapper grouper species implemented through Amendment 17A.
Amendment #17B (2010b)	1/30/11	PR: 75 FR 62488 FR: 75 FR 82280	-Specify ACL of 0 and prohibit fishing for speckled hind and warsaw grouper; -Prohibited harvest of 6 deepwater species seaward of 240 feet to curb bycatch of speckled hind and warsaw grouper (snowy grouper, blueline tilefish, yellowedge grouper, misty grouper, queen snapper, silk snapper). -Specify allocations, ACLs and AMs for golden tilefish; -Modified management measures as needed to limit harvest to the ACL or ACT; -Updated the framework procedure for specification of total allowable catch; -Specified ACLs, ACTs, and AMs, where necessary, for 9 species undergoing overfishing (snowy grouper, black grouper, black sea bass, red grouper, vermilion snapper, gag, speckled hind, warsaw grouper, golden tilefish);
Regulatory Amendment #9 (2010a)	Bag limit: 6/22/11 Trip limits: 7/15/11	PR: 76 FR 23930 FR: 76 FR 34892	-Established trip limits for vermilion snapper and gag; -Increased trip limit for greater amberjack; -Harvest management measures for black sea bass (trip limit, split season quotas, carry-over of unused ACL, gear restrictions, bag limit modification, and a spawning season closure).
Regulatory Amendment #10 (2010b)	5/31/11	PR: 76 FR 9530 FR: 76 FR 23728	-Eliminated closed area for snapper grouper species approved in Amendment 17A.
Regulatory Amendment #11 (2011c)	5/10/12	PR: 76 FR 78879 FR: 77 FR 27374	-Eliminated 240 ft harvest prohibition for six deepwater species (snowy grouper, blueline tilefish, yellowedge grouper, queen snapper, silk snapper, misty grouper);
Amendment # 25 Comprehensive Annual Catch	4/16/12	PR: 76 FR 74757 Amended PR: 76 FR 82264 FR: 77 FR 15916	-Reorganize FMUs to 6 complexes (deepwater, jacks, snappers, grunts, shallow-water groupers, porgies) (see final rule for species list);

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Limit Amendment (2011d)			-Established acceptable biological catch (ABC) control rules and established ABCs, ACLs, and AMs for species not undergoing overfishing; -Removed some species from South Atlantic FMU (Tiger grouper, black margate, blue-striped grunt, French grunt, porkfish, smallmouth grunt, queen triggerfish, crevalle, yellow jack, grass porgy, sheepshead, puddingwife); -Designated species as ecosystem component species (schoolmaster, ocean triggerfish, bank triggerfish, rock triggerfish, longspine porgy); -Specified allocations between the commercial and, recreational sectors for species not undergoing overfishing; -Limited the total mortality for federally managed species in the South Atlantic to the ACLs.
Amendment #24 (2011e)	7/11/12	PR: 77 FR 19169 FR: 77 FR 34254	-Rebuilding plan (including MSY, ACLs, AMs, and OY, and allocations) for red grouper.
Amendment #23 Comprehensive Ecosystem-based Amendment 2 (CE-BA2) (2011f)	1/30/12	PR: 76 FR 69230 FR: 76 FR 82183	-Designated the Deepwater MPAs as EFH-HAPCs; -Modify management measures for Octocoral; -Limit harvest of snapper grouper species in SC SMZs to the bag limit; -Modify sea turtle release gear; -Designated new EFP for pelagic Sargassum habitat.
Amendment #18A (2012a)	7/1/12	PR: 77 FR 16991 FR: 77FR3 2408	-Limited participation and effort in the black sea bass sector; -Modifications to management of the black sea bass pot sector; -Improved data reporting (accuracy, timing, and quantity of fisheries statistics).
Amendment #20A (2012b)	10/26/12	PR: 77 FR 19165 FR: 77 FR 59129	- Individual transfer quota (ITQ) program for wreckfish: -Defined and reverted inactive shares; -Redistributed reverted shares; -Established a share cap; -Established an appeals process.
Regulatory Amendment #12 (2012c)	10/9/12	PR: 77 FR 42688 FR: 77 FR 61295	-Revised the ACL and OY for golden tilefish; -Revised recreational AMs for golden tilefish;

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Amendment #18B (2013a)	5/23/13	PR: 77 FR 75093 FR: 77 FR 23858	For Golden Tilefish: -Limited participation and effort in the commercial sector through establishment of a longline endorsement; -Established eligibility requirements and allowed transferability of longline endorsement; -Established an appeals process; -Modified trip limits; -Specified allocations ACLs for gear groups (longline and hook and line); -Adjusted the fishing year.
Amendment #28 (2013b)	8/23/13	PR: 78 FR 25047 FR: 78 FR 44461	-Established regulations to allow harvest of red snapper in the South Atlantic (formula used to compute ACLs, AMs, fishing seasons).
Regulatory Amendment #13 (2013c)	7/17/13	PR: 78 FR 17336 FR: 78 FR 36113	-Revised the ABCs, ACLs (including sector ACLs), and ACTs for 37 species implemented by the Comprehensive ACL Amendment (see final rule for list of species). The revisions may prevent a disjunction between the established ACLs and the landings used to determine if AMs are triggered.
Regulatory Amendment #15 (2013d)	9/12/13	PR: 78 FR 31511 FR: 78 FR 49183	-Modified ACLs and OY for yellowtail snapper; -Modified the commercial and recreational yellowtail snapper fishing years and commercial spawning season closure; -Modified the gag commercial ACL and AM to remove the requirement that all other shallow-water groupers (black grouper, red grouper, scamp, red hind, rock hind, graysby, coney, yellowmouth grouper, and yellowfin grouper) are prohibited from harvest in the South Atlantic when the gag commercial ACL is met or projected to be met.
Regulatory Amendment #18 (2013e)	9/5/13	PR: 78 FR 26740 FR: 78 FR 47574	-Revised ACLs and OY for vermilion snapper; -Modified commercial trip limit for vermilion snapper; -Modified commercial fishing season and recreational closed season for vermilion snapper; -Revised ACLs and OY for red porgy.
Regulatory Amendment #19 (2013f)	ACL: 9/23/13 Pot closure: 10/23/13	PR: 78 FR 39700 FR: 78 FR 58249	-Specified ABC, and adjusted the ACL, recreational ACT and OY for black sea bass; -Implemented an annual closure on the use of black sea bass pots from November 1 to April 30.
Amendment #27 (2013g)	1/27/2014	PR:78 FR 78770 FR: 78 FR 57337	-Established the South Atlantic Council as the responsible entity for managing Nassau grouper throughout its range including federal waters of the Gulf of Mexico; -Modified the crew member limit on dual-permitted snapper grouper vessels;

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			-Modified the restriction on retention of bag limit quantities of some snapper grouper species by captain and crew of for-hire vessels; -Minimized regulatory delay when adjustments to snapper grouper species' ABC, ACLs, and ACTs are needed as a result of new stock assessments; -Removed blue runner from snapper grouper FMP; -Addressed harvest of blue runner by commercial fishermen who do not possess a South Atlantic Snapper Grouper Permit.
Amendment #31 Joint South Atlantic and Gulf of Mexico Generic Headboat Reporting Amendment (2013h)	1/27/2014	PR:78 FR 59641 FR: 78 FR 78779	-Included under the Generic charter/headboat reporting amendment, that modified required logbook reporting for headboat vessels to require electronic reporting, regarding snapper grouper landings.
Regulatory Amendment #14 (2014a)	12/8/2014	PR: 79 FR 22936 FR: 79 FR 66316	-Modified the commercial and recreational fishing year for greater amberjack; -Modified the commercial and recreational sector fishing years for black sea bass; -Modified the recreational AM for black sea bass; -Modified the recreational AM for vermilion snapper; -Modify the commercial trip limit for gag.
Regulatory Amendment # 21 (2014b)	11/6/2014	PR: 79 FR 44735 FR: 79 FR 60379	-Modified the definition of the overfished threshold (MSST) for red snapper, blueline tilefish, gag, black grouper, yellowtail snapper, vermilion snapper, red porgy, and greater amberjack.
Amendment #29 (2014c)	7/1/2015	NOA:79 FR 69819 PR: 79 FR 72567 FR: 80 FR 30947	-Updated the ABC control rule to incorporate methodology for determining the ABC of unassessed species; -Adjusted the ABCs for fourteen unassessed snapper-grouper species (see final rule); -Adjusted the ACLs and ACTs for three species complexes and four snapper-grouper species based on revised ABCs; -Established ACLs for unassessed species; -Modified gray triggerfish minimum size limits; -Established a commercial split season and commercial trip limits for gray triggerfish.
Blueline Tilefish Emergency Rule	4/17/2014 through 10/10/2014 or 4/18/2015	PR: 79 FR 21636 FR:79 FR 61262	-Removed the blueline tilefish portion from the deep-water complex ACL; -Established separate commercial and recreational ACLs and AMs for blueline tilefish.

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

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			hogfish, red porgy, the porgies complex (jolthead porgy, knobbed porgy, whitebone porgy, scup, and saucereye porgy); -Modified the AM for commercial golden crab fishery; -Adjusted sector allocations for dolphin.
Amendment #35 (2015d)	6/22/2016	NOA:81 FR 6222 PR:81 FR 11502 FR:81 FR 32249	-Removed black snapper, dog snapper, mahogany snapper, and schoolmaster from the Snapper-Grouper FMP; -Clarified regulations governing the use of Golden Tilefish Longline Endorsements.
Regulatory Amendment #16 (2016a)	12/29/2016 (closure) 1/30/2017 (gear markings)	NOI: 78 FR 72868 PR: 81 FR 53109	-Revise the prohibition of fishing with black sea bass pots from Nov.1-April 30. -Add additional gear marking requirements for black sea bass pot gear.
Regulatory Amendment #25 (2016b)	This rule is effective 8/12/2016, except for the amendments to §622.187(b)(2), §622.191 (a)(10), and §622.193(z) that are effective 7/13/2016.	PR:81 FR 34944 FR:81 FR 45245	-Revised commercial and recreational ACL for blueline tilefish; -Revised the recreational bag limit for black sea bass; -Revised the commercial and recreational fishing year for yellowtail snapper.
Amendment #37 (2016c)	TBD	NOI: 80 FR 45641 NOA:81 FR 69774 PR: 81 FR 91104	-Modify the hogfish fishery management unit; -Specify fishing levels for the two South Atlantic hogfish stocks; -Establish a rebuilding plan for the Florida Keys/East Florida stock; -Establish/revised management measures for both hogfish stocks in the South Atlantic Region, such as size limits, recreational bag limits, and commercial trip limits.
Amendment # 26 Comprehensive Ecosystem-Based Amendment 3 (CE-BA3) (OR – Bycatch Reporting Amendment)	TBD	TBD	-Modifies bycatch and discard reporting for commercial and for-hire vessels.
Amendment #36	TBD	TBD	-Establish SMZs to enhance protection for snapper-grouper species in spawning condition including speckled hind and warsaw grouper.

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
Amendment #41	TBD	TBD	-Update the MSY, ABC, ACL, OY, minimum stock size threshold, designate spawning months for regulatory purposes, and revise management measures for mutton snapper.

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Appendix D. Bycatch Practicability Analysis

Background

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

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

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

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

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

1.1 Population Effects for the Bycatch Species

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

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

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

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

Current Discards

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

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

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

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

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

The discard logbook only contains self-reported discards from a 20% sub-sample by region and gear fished; thus, it may not be representative of the entire fishery. Of the four codes described above, regulations (i.e., not legal size or out of season) were the most common reason selected, depending on the species, based on the number of self-reported discards (**Table D-3**). For the three species that had the highest number of discards reported on average annually (vermilion snapper, red porgy, and gray triggerfish), 'out of season' was the most common reason selected. Efforts to align any seasonal or quota closures among these three species would likely be beneficial in reducing discards. The regulation 'not legal size' was the most common reason selected for black grouper, gag, greater amberjack, and scamp. For species with a low estimated release mortality rate, such as greater amberjack and almaco jack, a high percentage of released fish likely survive resulting in minimal long-term population effects from a minimum size limit. Even for other species with higher release mortality rates, a minimum size limit could potentially benefit the stock by increasing spawning potential (larger fish are more fecund) and therefore remains an effective management measure to achieve reductions in harvest to keep landings below the annual catch limit (ACL).

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

Species	Mean Landings (lbs ww)	Mean Discards (N)
Almaco Jack	147,370	3,091
Banded Rudderfish	55,502	400
Black Grouper	82,906	1,699
Blackfin Snapper	456	0
Blueline Tilefish	110,824	5,106
Coney	127	0
Gag	331,809	8,127
Gray Triggerfish	285,310	17,516
Graysby	648	24
Greater Amberjack	857,415	3,630
Lesser Amberjack	6,026	86
Queen Snapper	1,639	0
Red Grouper	96,752	902
Red Hind	4,040	4
Red Porgy	140,569	24,754
Rock Hind	7,260	4

Scamp	144,823	1,164
Silk Snapper	11,444	4
Snowy Grouper	148,504	351
Vermilion Snapper	865,546	27,222
Yellowfin Grouper	1,485	0
Yellowmouth Grouper	182	0

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

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

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

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

Release Mortality Rates

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

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

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

Expected Impacts on Bycatch for the Proposed Actions

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

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

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

Action 4 would establish a commercial split season and modify the commercial trip limit for red porgy. The commercial split season and trip limit should lengthen the fishing season, reducing discards when other species are targeted, primarily gray triggerfish and vermilion snapper. Reducing the trip limit could also increase discards if the amount is overly restrictive and fishers catch more red porgy than the trip limit. Red porgy have a moderate estimated release mortality rate so some negative population effects would be expected from an increase in discards.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

1.4 Effects on Marine Mammals and Birds

Under Section 118 of the Marine Mammal Protection Act (MMPA), NMFS must publish, at least annually, a List of Fisheries (LOF) that places all U.S. commercial fisheries into one of three categories based on the level of incidental serious injury and mortality of marine mammals that occurs in each fishery. Of the gear utilized within the snapper grouper fishery, only the black sea bass pot is considered to pose an entanglement risk to marine mammals. The southeast U.S. Atlantic black sea bass pot sector is included in the grouping of the Atlantic mixed species trap/pot fisheries, which the 2016, 2017, and 2018 LOF classifies as a Category II (81 FR 20550, April 8, 2016, 81 FR 54019, August 15, 2016; and February 7, 2018, 83 FR 5349, respectively). Gear types used in these fisheries are determined to have occasional incidental mortality and serious injury of marine mammals. For the South Atlantic snapper grouper fishery, the best available data on protected species interactions are from the SEFSC Supplementary Discard Data Program (SDDP) initiated in July of 2000. The SDDP sub-samples 20% of the vessels with an active permit. Since August 2001, only three interactions with marine mammals have been documented; each was taken by handline gear and each released alive (McCarthy SEFSC database). The longline and hook-and-line gear components of the snapper grouper in the South Atlantic are classified in the 2016, 2017, and 2018 LOF as Category III fisheries.

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

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

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

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

Research and monitoring is ongoing to understand the effectiveness of proposed management measures and their effect on bycatch. In 1990, the SEFSC initiated a logbook program for vessels with federal permits in the snapper grouper fishery from the Gulf of Mexico and South Atlantic. Approximately 20% of commercial fishermen are asked to fill out discard information in logbooks; however, a greater percentage of fishermen could be selected with emphasis on individuals that dominate landings. The SEFSC is developing electronic logbooks, which could be used to enable fishery managers to obtain information on species composition, size distribution, geographic range, disposition, and depth of fishes that are released. Further, the Joint Commercial Logbook Reporting Amendment is being developed by the South Atlantic Council and the Gulf of Mexico Council, which would require electronic reporting of landings information by federally permitted commercial vessels to increase the timeliness and accuracy of landings and discard data.

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

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

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

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

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

1.6 Changes in Fishing Practices and Behavior of Fishermen

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

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

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

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

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

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

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

1.9 Changes in the Distribution of Benefits and Costs

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

1.10 Social Effects

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

Conclusion

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

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Appendix E. Regulatory Impact Review

Appendix F. Regulatory Flexibility Analysis

Appendix G. Other Applicable Laws

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 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 2009a) 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 South Atlantic 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 Essential Fish Habitat (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 deepwater Coral HAPCs to protect what is thought to be the largest continuous distribution (>23,000 square miles) of pristine, deepwater 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 Deepwater Ecosystem Management

The South Atlantic Council manages coral, coral reefs and live/hard bottom habitat, including deepwater corals, through the Fishery Management Plan for Coral, Coral Reefs and Live/Hard Bottom Habitat of the South Atlantic Region (Coral FMP). Mechanisms exist in the FMP, as amended, to further protect deepwater coral and live/hard bottom habitats. The SAFMC's Habitat and Environmental Protection Advisory Panel and Coral Advisory Panel have supported proactive efforts to identify and protect deepwater coral ecosystems in the South Atlantic region. Management actions in Comprehensive Ecosystem-Based Amendment (CE-BA 1) (SAFMC 2009b) established deepwater coral HAPCs (C- HAPCs) to protect what is thought to be the largest continuous distribution (>23,000 square miles) of pristine deepwater 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 deepwater 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 deepwater Coral HAPCs designated under CE-BA 1; and amended the Snapper Grouper FMP to designate EFH-HAPCs for golden and blueline tilefish and the deepwater 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 (SECOORA) 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, Deepwater 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
Essential Fish Habitat 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 Essential Fish Habitat, 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 deepwater 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 deepwater 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 Essential Fish Habitat, 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 deepwater ecosystems while providing for traditional fisheries for the Golden Crab and Royal Red shrimp in areas where they do not impact deepwater coral habitat. The stakeholder based process taps in on an extensive regional Habitat and Ecosystem network. Support tools 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 deepwater 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 South Atlantic 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 deepwater 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 deepwater 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.

Deepwater 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, Essential Fish Habitat 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 essential fish habitat 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 essential fish habitat 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‰) 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 essential fish habitat 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‰) 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 Deepwater Coral HAPCs as EFH-HAPCs under the Coral FMP as follows:

Deepwater 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 South Atlantic 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 South Atlantic 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 gears 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 deepwater 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 deepwater 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 deepwater 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.

South Atlantic 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).

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Appendix I. Fishery Impact Statement

Appendix J. Commercial Data Analyses of Management Alternatives

Version sent by SERO on 3/14/18

LAPP/DM Branch
Southeast Regional Office
NOAA Fisheries Service

Introduction

The South Atlantic Fishery Management Council (Council) manages Snapper-Grouper stocks in federal waters from the Florida Keys to the Virginia/North Carolina border. In Vision Blueprint Commercial Regulatory Amendment 27 for the Snapper Grouper Fishery of the South Atlantic Region (Reg-27), the Council has proposed modifications of commercial regulations such as fishing seasons, trip limits, seasonal closures, and size limits for species in the snapper grouper fishery. These proposed management measures are intended to address commercial stakeholder input to enable equitable access for fishermen participating in the snapper grouper, and to minimize discards. This document evaluates the impacts of proposed alternatives in Reg-27 and provides analytical support for the Council's decision-making process.

Methods & Results

For most actions, landings were expressed as daily catch rates by month, based on open federal days, and two catch rate projection models were developed: (1) based on the last three years of data (2014-2016; "Last 3"), and (2) a seasonal auto-regressive integrated moving average (SARIMA) model. In the "Last 3" model, the mean and standard deviation of the last three years of data were used to generate monthly mean and 95% confidence interval projection estimates for daily catch rates, which were subsequently expanded into estimates of monthly landings by multiplying by the number of days in each month. In a SARIMA(p,d,q)x(P,D,Q) model (Box et al. 2013), the autoregressive component (p) represents the lingering effects of previous observations, the integrated component (d) represents temporal trends, and the moving average component (q) represents lingering effects of previous random shocks (or error). The SARIMA models were implemented using Proc ARIMA in SAS version 9.2 (SAS Institute). Following Farmer & Froeschke (2015), all possible combinations of single-difference SARIMA models for landings per day by month were considered (**Table S-1**). A single-difference SARIMA model only considers a maximum of one differencing term in the annual and one differencing term in the seasonal component. Differencing terms considered were annual and monthly. All SARIMA models were fit using conditional least squares. Stationarity tests were used to guide differencing selection. Final SARIMA model selection was guided by the examination of autocorrelations, inverse autocorrelations, partial autocorrelations, cross-correlations, residual diagnostics, and AIC.

The Last 3 approach is a simple average and highly sensitive to recent trends. The SARIMA approach generates statistical fits to the data. The final SARIMA model, as selected by AIC and other factors, represents the best fit to the data, accounting for any seasonal and/or interannual trends. The SARIMA model approach is sensitive to recent trends, captures long term trends, and has been shown to provide superior fits to catch trends as compared to recent year's data approaches (Farmer & Froeschke 2015). When alternative projection modeling approaches provide very different mean estimates of catch rates and closure dates, this should be interpreted as an indication that historical data are not very informative of future trends. When different modeling approaches provide reasonably close estimates of catch rates and closure dates but confidence limits are wide, this should be interpreted as high variability within the historical data. Both modeling approaches were retained for projections to provide the Council information regarding the uncertainty in the projected closure dates. Most of the species under consideration in Reg-27 are indirectly harvested during trips targeting other stocks; for this reason, uncertainty in the historical data is often high. Similarly, actions involving targeted species often require extrapolation of catch rates to periods that have been subject to recent closures or a complex management history, further contributing to uncertainty.

Action 1. Establish a commercial split season and modify the commercial trip limit for blueline tilefish

- **Alternative 1 (No Action)**. The commercial fishing year for blueline tilefish in the South Atlantic EEZ is from January 1 to December 31. The commercial trip limit is 300 pounds gutted weight.
- **Alternative 2.** Specify two commercial fishing seasons for blueline tilefish. Allocate the blueline tilefish commercial ACL into two quotas: 40% to the period January 1 through June 30 and 60% to the period July 1 through December 31. Any remaining quota from Season One would transfer to Season Two. Any remaining quota from Season Two would not be carried forward.
    - **Sub-alternative 2a.** Season 1 trip limit = 100 pounds lbs gw, Season 2 trip limit = 300 pounds lbs gw.
    - **Sub-alternative 2b.** Season 1 trip limit = 150 pounds lbs gw, Season 2 trip limit = 300 pounds lbs gw.
- **Alternative 3.** Modify the commercial trip limit for blueline tilefish:
    - **Sub-alternative 3a**. 100 lbs gw from January 1 through April 30 and 300 lbs gw from May 1 through December 31
    - **Sub-alternative 3b**. 150 lbs gw from January 1 through April 30 and 300 lbs gw from May 1 through December 31
    - **Sub-alternative 3c.** 100 lbs gw from January 1 through June 30 and 300 lbs gw from July 1 through December 31.

Average monthly commercial landings for blueline tilefish by state from 2004-2013 are provided in **Figure 1**. The percentage of annual blueline tilefish landings from each state from 2002-2016 is provided in **Figure 2**. Due to recent quota closures (**Table 1**), data were not available from recent years to inform Season 2 landings. The Council may want to consider moving this action to blueline tilefish amendment (Amendment 38) given the pending completion in June 2018 of the SEDAR 50 stock assessment, which may provide updated stock status and ABC recommendations. Also, blueline tilefish management has been very dynamic over the past few years, with many regulatory changes including a prohibition of harvest beyond 240 fathoms in

2011. The input data available for forecasting future landings have consequently been affected, which has implications for the reliability of analyses. In general, the most recent year is probably the best available predictor of future trends.

Trip limit impacts were simulated by modifying and re-summarizing landings from commercial logbook trip records (SEFSC commercial logbook data, accessed April 2017). Total monthly landings 2006-2016 were compared between modified (500, 400, 300, 250, 200, 150, and 100-lb gw trip limit) and unmodified trip records. Monthly scalars were applied to projected landings data for the alternatives listed above. Monthly trip limit scalars on projected catches were determined using the last three fully open years without a trip limit in place within this range (**Table 2**). All trip limit scalars were based on a 300-lb trip limit baseline, with landings from Mar 2015-June 2016 scaled up from the 100-lb trip limit that was in place at that time.

To predict baseline 2018 landings for Alternative 1, monthly commercial landings data for 1997-2016 was obtained from the NOAA Southeast Fisheries Science Center (SEFSC) annual catch limit (ACL) commercial database (accessed May 2017). Input data was evaluated from 1997 onward because species identification has improved through time. Landings under a back-calculated 300-lb trip limit were converted to daily catch rates by month, which considered the number of open days during months with quota closures or seasonal restrictions on harvest. Landings were projected using the Last 3 and SARIMA methods described above. Commercial discards were estimated by month using the SEFSC Commercial Logbook and Supplemental Discard Logbook (accessed May 2017) to develop a discard rate in numbers of fish per unit effort, by species, gear, and region, and expand that rate to the total effort in the fishery by gear and region. Note that a randomly selected comprehensive observer program is not available in the South Atlantic, thus estimation of commercial discards is reliant upon self-reported data.

The final selected model was a ARIMA(1,0,0)X(0,1,1)s with Adj. R^2=0.53 (**Figure 3**). Projected mean and 95% confidence intervals for daily catch rates were expanded into estimates of monthly landings by multiplying by the number of days in each month. Peak blueline tilefish landings were projected for August, followed by July (**Figure 4**). Projections using the Last 3 model anticipated 50% of the ACL would be reached in April (95% CI: Mar-June). SARIMA projections estimated 50% of the ACL would be reached in May (95% CI: Jan-Dec). Projected season lengths under Alternatives 1-3 are provided in **Table 3**. Due to recent dynamic changes in the fishery and challenges accounting for the imposition of a 300-lb trip limit in July 2016, there is substantial uncertainty in these projections. Expanded estimates of commercial discards for blueline tilefish from the SEFSC Supplemental Commercial Discard Logbook (accessed May 2017) are provided in **Figure S-1**.

Action 2. Establish a commercial split season for snowy grouper

- **Alternative 1 (No Action)**. The commercial fishing year for snowy grouper in the South Atlantic federal waters is from January 1 to December 31.
- **Alternative 2**. Specify two commercial fishing seasons for snowy grouper. Allocate the snowy grouper commercial ACL into two quotas: 60% to the period January 1 through June 30 and 40% to the period July 1 through December 31. Any remaining quota from Season 1 would transfer to Season 2. Any remaining quota from Season 2 would not be carried forward.
- **Alternative 3**. Specify two commercial fishing seasons for snowy grouper. Allocate the snowy grouper commercial ACL into two quotas: 70% to the period January 1 through June 30 and 30% to the period July 1 through December 31. Any remaining quota from Season 1 would transfer to Season 2. Any remaining quota from Season 2 would not be carried forward.

Average monthly commercial landings for snowy grouper are provided by state 2002-2005 and 2007-2011 in **Figure 5**. The years 2006 and 2012-2016 were excluded due to closures. The percentage of annual snowy grouper landings from each state from 2002-2016 is provided in **Figure 6**. Similar to blueline tilefish (see Action 1, above), commercial landings data were converted to daily catch rates within months for 1997-2016. There have been several recent quota closures for snowy grouper (**Table 4**). Two projection models were fit to the data: (1) mean catch rates 2014-2016 ("Last 3") and (2) a SARIMA model. In the Last 3 model, the ratio of Sept to Oct-Dec landings 2010-2012 was used to generate extrapolated catch estimates for Oct-Dec due to quota closures in the 2014-2016 period. No data adjustments were made for the change in trip limit from 100 lbs to 200 lbs in Aug 2015. For the SARIMA model, a covariate was introduced for the trip limits of 2500 lbs (1994-Sept 2006), 275 lbs (Oct 2006-Dec 2006), 175 lbs (2007), 100 lbs (2008-July 2015), and 200 lbs (Aug 2015-on). Based on commercial logbook self-reported catch records, some trips with harvest above the status quo trip limit was identified in each year 2010-2015. The final selected SARIMA model was ARIMA(0,1,1)X(0,1,1)s with Adj. R^2=0.84 (**Figure 7**).
The numerous changes in trip limits and other regulations for snowy grouper likely make recent data a poor predictor of future trends. Under Alternative 1 (No Action), the ACL is anticipated to be met by Sept (95% CI: June-No Closure) or Mar (95% CI: Feb-Nov) by the Last 3 and SARIMA models, respectively (**Figure 8**). The Last 3 model predicts 50% of the ACL will be achieved by May (95% CI: Apr-Sept); the SARIMA model predicts 50% of the ACL will be met by Feb (95% CI: Jan-July). The broad confidence intervals for these predictions and the recent changes in the trip limit indicate high uncertainty in these predictions and they should be interpreted with caution.

Projected season lengths under Alternatives 1-3 are provided in **Table 5**. Expanded estimates of commercial discards for snowy grouper from the SEFSC Supplemental Commercial Discard Logbook (accessed May 2017) are provided in **Figure S-3**. Snowy grouper are landed in every state, with the majority of vessels landing snowy grouper operating out of Florida (**Figure S-10**). Note this analysis was performed at the state level, so vessels landing in multiple states would be counted for each state.

Action 3. Establish a commercial split season for greater amberjack

- **Alternative 1 (No Action)**. The commercial fishing year for greater amberjack in the South Atlantic exclusive economic zone is from March 1 to the end of February. During April each year, no person may sell or purchase greater amberjack harvested from the South Atlantic exclusive economic zone, and the harvest and possession limit is one per person per day or one per person per trip, whichever is more restrictive. The commercial trip limit in March and from May through the end of February each fishing year is 1,200 pounds whole weight.
- **Alternative 2**. Specify two commercial fishing seasons for greater amberjack. Allocate the commercial ACL for greater amberjack into two quotas: 50% to the period March 1 through August 31 and 50% to the period September 1 through the end of February. Any remaining quota from Season 1 would transfer to Season 2. Any remaining quota from Season 2 would not be carried forward. During April, no person may sell or purchase a greater amberjack harvested from the South Atlantic exclusive economic zone.
    - **Sub-alternative 2a.** Season 1 trip limit = 1,200 pounds lbs ww, Season 2 trip limit = 1,000 pounds lbs ww.
    - **Sub-alternative 2b.** Season 1 trip limit = 1,000 pounds lbs ww, Season 2 trip limit = 800 pounds lbs ww.
    - **Sub-alternative 2c.** Trip limit equals 1,000 pounds whole weight in both seasons.
    - **Sub-alternative 2d.** Trip limit equals 1,000 pounds whole weight in both seasons. A trip limit reduction to 500 pounds whole weight would occur in each season once 75% of the seasonal quota is met or projected to be met. A trip limit reduction would not occur in Season 2 unless 75% of the season's quota is met or is projected to be met by January 31.
- **Alternative 3**. Specify two commercial fishing seasons for greater amberjack. Allocate the commercial ACL for greater amberjack into two quotas: 60% to the period March 1 through August 31 and 40% to the period September 1 through the end of February. Any remaining quota from Season 1 would transfer to Season 2. Any remaining quota from Season 2 would not be carried forward. Commercial harvest would still be prohibited annually in April.
    - **Sub-alternative 3a.** Season 1 trip limit equals 1,200 pounds whole weight, Season 2 trip limit equals 1,000 pounds whole weight.
    - **Sub-alternative 3b.** Season 1 trip limit equals 1,000 pounds whole weight, Season 2 trip limit equals 800 pounds whole weight.
    - **Sub-alternative 3c.** Trip limit equals 1,000 pounds whole weight in both seasons.
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- **Alternative 4.** Reduce the greater amberjack commercial trip limit. During April each year, no person may sell or purchase a greater amberjack harvested from the South Atlantic exclusive economic zone.

- **Sub-alternative 4a.** 1,000 pounds whole weight
- **Sub-alternative 4b.** 800 pounds whole weight

Average monthly commercial landings for greater amberjack by state from 2005-2015 are provided in **Figure 9**. The percentage of annual greater amberjack landings from each state from 2012-2016 is provided in **Figure 10**. State landings of greater amberjack were restricted to the most recent five years of data due to high proportions of unclassified amberjacks prior to 2012. Even after 2012, some unclassified amberjacks (greater amberjack, lesser amberjacks, banded rudderfish, and almaco jack) were present in North Carolina landings. North Carolina's seafood dealers began using species-specific codes for greater amberjack in 2011, but it was not until 2015 that unclassified amberjack was completely removed as an option for all dealers. It was difficult to this evaluate alternative given the unspecified percentages. Similar to blueline tilefish (see Action 1, above), commercial landings data were converted to daily catch rates within months for 1997-2016. There have been several recent quota closures for greater amberjack (**Table 6**). Two projection models were fit to the data: (1) mean catch rates 2014-2016 ("Last 3") and (2) a SARIMA model. The final selected SARIMA model was a ARIMA(1,1,0)X(0,1,1)s with Adj. R^2=0.86 (**Figure 11**).

Under Alternative 1 (No Action), the ACL is anticipated to be met by Nov (95% CI: Sept-No Closure) or July (95% CI: Feb-No Closure) by the Last 3 and SARIMA models, respectively (**Figure 12**). The Last 3 model predicts 50% of the ACL will be achieved by June (95% CI: May-July); the SARIMA model predicts 50% of the ACL will be met by May (95% CI: Mar-Not Met). The broad confidence intervals indicate high uncertainty and these predictions should be interpreted with caution. Trip limit reductions are provided in **Table 7**. Estimated closure dates for the various alternatives are provided in **Table 8**.

Expanded estimates of commercial discards for greater amberjack from the SEFSC Supplemental Commercial Discard Logbook (accessed May 2017) are provided in **Figure S-4**.

Action 4. Establish a commercial split season for red porgy

- **Alternative 1 (No Action).** The commercial fishing year for red porgy in the South Atlantic exclusive economic zone is from January 1 to December 31. During January 1 through April 30 each year, no person may sell or purchase red porgy harvested from the South Atlantic exclusive economic zone, and the harvest and possession limit is three per person per day or three per person per trip, whichever is more restrictive. From May 1 through December 31 each year, the trip limit for red porgy is 120 fish.
- **Alternative 2.** Specify two commercial fishing seasons for red porgy. Allocate the commercial red porgy annual catch limit into two quotas: 30% to the period January 1 through April 30 and 70% to the period May 1 through December 31. Any remaining quota from Season 1 would transfer to Season 2. Any remaining quota from Season 2 would not be carried forward. Remove the sale and purchase prohibition during January 1 to April 30 each year. Retain the commercial trip limit of 120 fish from May 1 through December 31 and specify a commercial trip limit from January 1 through April 30 of:
    - **Sub-alternative 2a.** 30 fish
    - **Sub-alternative 2b.** 45 fish
    - **Sub-alternative 2c.** 60 fish
- **Alternative 3.** Specify two commercial fishing seasons for red porgy. Allocate the commercial red porgy ACL into two quotas: 50% to the period January 1 through April 30 and 50% to the period May 1 through December 31. Any remaining quota from Season 1 would transfer to Season 2. Any remaining quota from Season 2 would not be carried forward. Remove the sale and purchase prohibition during January 1 to April 30 each year. Retain the commercial trip limit of 120 fish from May 1 through December 31 and specify a commercial trip limit from January 1 through April 30 of:
    - **Sub-alternative 3a.** 30 fish
    - **Sub-alternative 3b.** 45 fish
    - **Sub-alternative 3c.** 60 fish
- **Alternative 4.** Remove the harvest and possession restrictions, and sale and purchase prohibition for red porgy from the South Atlantic during January 1 to April 30 each year. Specify a commercial trip limit of 120 fish from January 1 through December 31.

Average monthly commercial landings for red porgy by state from 2005-2012 and 2014-2016 are provided in **Figure 13**. The year 2013 was excluded due to a closure. The percentage of annual red porgy landings from each state from 2002-2016 is provided in **Figure 14**. It was difficult to this evaluate alternative given the unspecified percentages. Similar to blueline tilefish (see Action 1, above), commercial landings data were converted to daily catch rates within months for 1997-2016. There has only been one recent quota closure for red porgy (**Table 9**). Two projection models were fit to the data: (1) mean catch rates 2014-2016 ("Last 3") and (2) a SARIMA model. For the Last 3 model, landings in the event of a Jan-Apr opening of the fishery were extrapolated from mean 2014-2016 May landings using the mean ratio of May landings to Jan-Apr landings 1986-1999 (the final year the fishery was open Jan-Apr). Final SARIMA model selection was guided by the examination of autocorrelations, inverse autocorrelations, partial autocorrelations, cross-correlations, residual diagnostics, and AIC. In the SARIMA model, Jan-Apr catch rates were left blank 2000-present, allowing the model to freely estimate these parameters from the input time series. The final selected model was a ARIMA(1,1,0)X(0,1,1)s with Adj. R^2=0.89 (**Figure 15**).

With a Jan-Apr closure, 50% of the ACL is projected to be caught by August (95% CI: July-Sept) or Sept (95% CI: June-No Closure) by the Last 3 and SARIMA models, respectively (**Figure 16: left**). Between Jan-June 30, 38,247 lb ww (95% CI: 23,862-52,632 lb ww) to 24,646 lb ww (95% CI: 0-111,485 lb ww) is projected to be caught by the Last 3 and SARIMA models, respectively.

Without a Jan-Apr closure, 50% of the ACL is projected to be caught by May (95% CI: Apr-July) or July (95% CI: Feb-Dec 31) by the Last 3 and SARIMA models, respectively (**Figure 16: right**). Between Jan-June 30, 110,456 lb (95% CI: 63,041-157,871 lb ww) to 60,393 lb ww (95% CI: 0-294,705 lb ww) is projected to be caught by the Last 3 and SARIMA models, respectively. The wide confidence intervals for these projections indicate the substantial uncertainty in the predictions, especially for the impacts of removing the Jan-Apr closure, which has been in place since 2000.

Expanded estimates of commercial discards for red porgy from the SEFSC Supplemental Commercial Discard Logbook (accessed May 2017) are provided in **Figure S-2**.

The Commercial Logbook provides landings at the trip-level in pounds, but the proposed red porgy trip limits are in numbers of fish. Commercial Trip Interview Program (TIP, accessed Oct 2017) data was used to evaluate the potential impacts of the various proposed trip limit alternatives. The TIP data is not a comprehensive sample of the fish landed on a given trip, and thus cannot be directly used for determination of trip limit impacts. Annual mean landed weight from representative samples from commercial trips intercepted by the TIP were used to estimate the number of fish landed in Commercial Logbook reported trips. Data were stratified by state for 1995-2005, and Florida and Georgia data were pooled for 2006-2016 because Georgia TIP data were very limited (n=1) from 2006-2016. Florida and Georgia data were more highly correlated than Georgia and South Carolina data during the 1995-2005 period (83.6% vs. 80.9%). Mean weights (pounds whole weight) were determined from TIP data using measured weights when available in either round (whole) weight or gutted weight with head on, using a conversion factor of 1.04 for gutted to whole weight. When measured weights were unavailable, meristic conversions were used to convert measured length (total, standard, or fork length) to total length in mm, and then to convert total length to whole weight in pounds using conversion factors found in Table 1 of SEDAR-1 Update (2006). These conversions were not updated by SEDAR-1 Update (2012), the most recent red porgy stock assessment. Numbers caught on Commercial Logbook trips were computed by dividing the reported landings in pounds whole weight by the annual mean weight from the TIP data by state and by year (**Figure 17**). Estimated reductions from projected landings for various trip limits are shown in **Table 10**. Projected quota closure dates are shown in **Table 11**. Projected cumulative landings trends are shown in **Figure 18**.

Action 5. Modify the commercial trip limit for vermilion snapper in the second season

- **Alternative 1 (No Action)**. The commercial fishing year for vermilion snapper in the South Atlantic exclusive economic zone is from January 1 to December 31. The commercial annual catch limit is split into two quotas: 50% to the period January 1 through June 30 and 50% to the period July 1 through December 31. Any remaining quota from Season 1 transfers to Season 2. Any remaining quota from Season 2 is not carried forward. The commercial trip limit for vermilion snapper in the South Atlantic exclusive economic zone is 1,000 pounds gutted weight. For both seasons, when 75% of the vermilion snapper seasonal quota is met or is projected to be met, the trip limit is reduced to 500 pounds gutted weight.
- **Alternative 2**. Retain the commercial trip limit and trip limit reduction in Season 1 (January 1 through June 30). For Season 2 (July 1 through December 31), modify the commercial trip limit to 750 pounds gutted weight and remove the trip limit reduction. Any remaining quota from Season 1 transfers to Season 2. Any remaining quota from Season 2 is not carried forward.
- **Alternative 3**. Retain the commercial trip limit and trip limit reduction in Season 1 (January 1 through June 30). For Season 2 (July 1 through December 31), modify the commercial trip limit to 500 pounds gutted weight and remove the trip limit reduction. Any remaining quota from Season 1 transfers to Season 2. Any remaining quota from Season 2 is not carried forward.
- **Alternative 4.** Modify the commercial trip limits for both seasons (January 1 through June 30; July 1 through December 31) and remove the trip limit reductions. Any remaining quota from Season 1 transfers to Season 2. Any remaining quota from Season 2 is not carried forward.
    - **Sub-alternative 5a.** 1,000 pounds
    - **Sub-alternative 5b.** 850 pounds
    - **Sub-alternative 5c.** 700 pounds

Similar to blueline tilefish (see Action 1, above), commercial landings data were converted to daily catch rates within months for 1997-2016. There have been several recent quota closures for vermilion snapper (**Table 12**). Two projection models were fit to the data: (1) mean catch rates 2014-2016 ("Last 3") and (2) a SARIMA model. For vermilion snapper, models with differencing on the monthly term predicted population collapses; as such, model selection was restricted to annual differencing models. The final selected model was a ARIMA(1,0,0)X(0,1,1)s with Adj. R^2=0.88 (**Figure 19**). Trip limit impacts were simulated by modifying and re-summarizing landings from commercial logbook trip records (SEFSC commercial logbook data, accessed April 2017). Total monthly landings 2006-2016 were compared between modified (750 and 500 lb gw trip limit) and unmodified trip records. Monthly scalars were applied to projected landings data for the alternatives listed above. Monthly trip limit scalars on projected catches were determined using the last three fully open years (**Table 13**).

Daily catches were projected for Season 1 and Season 2 using projected monthly catch rates. Cumulative landings were tracked and trip limits were applied to scale monthly catch rates when 75% of the ACL was met. For Season 1, the ACL is anticipated to be met by Mar (95% CI: Mar-Apr) or Apr (95% CI: Feb-June) by the Last 3 and SARIMA models, respectively. Projected trip limit reduction dates and closure dates for Season 2 are provided in **Table 14**. Last 3 and SARIMA model projections were relatively consistent, indicating fairly high confidence in projected closure dates (**Figure 20**).
Expanded estimates of commercial discards for vermilion snapper from the SEFSC Supplemental Commercial Discard Logbook (accessed May 2017) are provided in **Figure S-5**.

Action 6. Implement a commercial trip limit for the Other Jacks Complex

- **Alternative 1 (No Action)**. There is no commercial trip limit for the Other Jacks Complex (lesser amberjack, almaco jack, and banded rudderfish).
- **Alternative 2**. Establish a commercial trip limit for the Other Jacks Complex.
    - **Sub-alternative 2a.** 500 pounds gutted weight with a trip limit reduction to 250 pounds gutted weight once 75% of the annual catch limit is met or projected to be met.
    - **Sub-alternative 2b.** 400 lbs gutted weight with a trip limit reduction to 200 pounds gutted weight once 75% of the annual catch limit is met or projected to be met.
    - **Sub-alternative 2c.** 300 lbs gutted weight with a trip limit reduction to 150 pounds gutted weight once 75% of the annual catch limit is met or projected to be met.
- **Alternative 3**. Establish a commercial trip limit for the Other Jacks Complex.
    - **Sub-alternative 3a.** 500 lbs gw
    - **Sub-alternative 3b.** 400 lbs gw
    - **Sub-alternative 3c.** 300 lbs gw

Similar to blueline tilefish (see Action 1, above), commercial landings data were converted to daily catch rates within months for 1997-2016. There have been several recent quota closures for the Jacks complex (**Table 15**). Two projection models were fit to the data: (1) mean catch rates 2014-2016 ("Last 3") and (2) a SARIMA model. For the Last 3 model, projected catch rates for Sept-Dec were based on the mean ratio of August to Sept-Dec landings from the last three completely open fishing years during those months (2009-2011) applied to mean August 2014-2016 catch rates. The final selected SARIMA model was a ARIMA(0,0,1)X(0,1,1)s with Adj. R^2=0.79 (**Figure 21**). Projections were developed for the Jacks complex, with Alternative 3 almaco jack landings partitioned using the mean monthly ratio of almaco jack to Jacks complex landings from the most recent three fishing years (**Figure 22**).

Trip limit impacts were simulated by modifying and re-summarizing landings from commercial logbook trip records (SEFSC commercial logbook data, accessed April 2017). Total monthly landings 2006-2016 were compared between modified (500, 400, and 300 lb ww trip limit) and unmodified trip records. Monthly scalars were applied to projected landings data for the alternatives listed above. Monthly trip limit scalars on projected catches were determined using the last three fully open years (**Table 16**). Daily catches were estimated using projected monthly catch rates. Cumulative landings were tracked under different trip limit alternatives.

Under Alternative 1 (No Action), the ACL is anticipated to be met by July (95% CI: June-Dec) or June (95% CI: Apr-No Closure) by the Last 3 and SARIMA models, respectively (**Figure 23**). Although the predictions from the Last 3 model and SARIMA model are similar, the broad confidence intervals for these predictions suggest some uncertainty in these predictions and they should be interpreted with caution. **Table 17** provides the projected mean and 95% confidence limits for quota closure dates under the various Action 6 alternatives. Note that the stepdown when 75% of the ACL is met does not provide substantial increases in season length.

Expanded estimates of commercial discards for the Jacks complex from the SEFSC Supplemental Commercial Discard Logbook (accessed May 2017) are provided in **Figure S-6**.

Action 7. Implement a minimum size limit for almaco jack for the commercial sector

- **Alternative 1 (No Action). There is no commercial minimum size limit specified for almaco jack.**
- **Alternative 2. Specify a minimum size limit for almaco jack for the commercial sector:**
    - **Sub-alternative 2a. 20 inches fork length**
    - **Sub-alternative 2b. 22 inches fork length**
    - **Sub-alternative 2c. 24 inches fork length**
    - **Sub-alternative 2d. 26 inches fork length**

The South Atlantic Fishery Management Council does not currently specify a commercial minimum size limit for almaco jack. To evaluate the effects of establishing a minimum size limit, commercial catch data collected by the Southeast Fisheries Science Center's (SEFSC) Trip Intercept Program (TIP) were used to determine the proposed impact. Almaco jacks landed by the commercial sector in the South Atlantic from the most recent three years available were used in the analyses. The size limit analyses were not stratified by gear since TIP data is collected to be a representative sample of the fishery and logbook data indicated > 95% of almaco jacks landed are captured with vertical line gear.

TIP recorded 3,587 almaco jacks landed in the South Atlantic from 2014 – 2016 with all lengths converted to inches fork length (FL). The size limit analysis estimated the percent decrease of landings in whole weight for each of the four proposed size limits if implemented during this time, thus the weight of each fish was required. When whole weight data was available it was used, and gutted weights were converted using the SEFSC conversion factor of 1.04. When weight data was unavailable, it was estimated from length using the almaco jack weight-length equation defined in SEDAR 49 (2016).

Figure 24 provides the commercial sector almaco jack length distribution in 2-inch increments from 2014 – 2016. Approximately, 37% of the almaco jacks landed are below the shortest minimum size limit being proposed in **Sub-alternative 2a** of 20 inches FL. Implementing the largest proposed minimum size limit (26 inches FL in **Sub-alternative 2d)** would reduce the number of almaco jacks landed by 65%. Each 2-inch size bin between 20 and 26 inches FL would reduce the number of almaco jacks landed between an additional 8.8% to 10%. Decreases in the percentage of landings were calculated for minimum size limits (MSL) at 2-inch intervals between 20 – 26 inches FL as follows:

$$\left(\frac{(Current\ Catch - Weight\ of\ fish\ that\ are\ greater\ than\ or\ equal\ to\ the\ MSL)}{Current\ Catch}\right) * 100$$

Data were pooled for the most recent three years of complete data (2014 – 2016) with the assumption that recent weights will likely reflect future weights landed in the fishery. A decrease in harvest weight ranged between 11.5 and 34.2% for each of the minimum size limits proposed (**Table 18)**. Any of the proposed size limits would likely slow the harvest rate of almaco jack. The slower harvest rates could lengthen the current commercial seasons for the Jacks Complex, which closed in June, July, or August from 2012 – 2016, because almaco jacks comprise the majority of Jacks Complex landings (**Figure 22**). Establishing a minimum size limit would likely result in increased discarding of under sized almaco jacks, but a low discard mortality rate (<10%) was supported by fishers at SEDAR 49 (2016). Fishers cited the shallower depth of capture and general hardiness of almaco jacks compare to other jack species as support for a very low discard mortality rate. Even with a low discard mortality rate between 0 and 10%, some smaller individuals will die from mortality or could be used as bait to target other species. The reliability of this analysis is dependent upon the accuracy of the underlying data and input assumptions. This analysis assumes that the commercial landings of almaco jacks from 2014 – 2016 will reflect the size distribution of almaco commercial landings in the future.

Action 8. Modify the seasonal prohibition on commercial harvest and possession of shallow-water groupers

- **Alternative 1 (No Action).** During January through April, no person may sell or purchase a gag, black grouper, red grouper, scamp, red hind, rock hind, yellowmouth grouper, yellowfin grouper, graysby, or coney harvested from or possessed in the South Atlantic exclusive economic zone.
- **Alternative 2.** Maintain seasonal prohibition on sale and purchase of shallow-water groupers annually from January 1 to April 30 in the exclusive economic zone off Georgia and east Florida. Prohibit sale and purchase of **red grouper** in the exclusive economic zone off North Carolina and South Carolina
  - **Sub-alternative 2a.** January – May (five months)
  - **Sub-alternative 2b.** February – May (four months)
  - **Sub-alternative 2c.** March – June (four months)

It is very challenging to make meaningful predictions of the amount of harvest that will be realized with the removal/modification of the shallow-water grouper closure due to the duration it has been in place. Confidentiality concerns prohibit the disclosure of a time series of landings for the various species considered in the action. Mean 2014-2016 and projected monthly landings of shallow-water grouper species are provided in **Figure 25**.

This analysis required backfilling landings for the Jan-Apr closed time period. The months of Mar-Apr were closed to gag and black grouper were closed by Amendment 9 in 1999. The months of Jan-Apr were closed to all shallow-water grouper were closed by Amendment 16 in mid-2009. Estimates of landings that would be realized during openings in the Jan-Apr time period are based on the mean ratios from the last three completely open fishing years, for all shallow-water grouper stocks, for those months. For Jan-Feb, the mean ratio of Jan-Feb to May 2007-2009 landings was applied. For Mar-Apr, the mean ratio of Mar-Apr to May 1996-1998 landings was applied. Landings in the Jan-Apr period are projected to be relatively high (between 40-80% of May landings); however, this analytical approach does not account for the potential redistribution of peak effort to May following the implementation of the Mar-Apr closure in 1999, nor does it account for potential declines in catch rates in the May-Dec period if the fishery opened earlier in the calendar year. Thus, it is likely the projected landings presented in Figure 22 are an upper bound for what might be caught if the closure months were modified.

Sale and purchase of red grouper in the exclusive economic zone off North Carolina and South Carolina was prohibited in mid-2009. The mean monthly percentage of annual landings 2006-2008 are shown in **Table 19**. January-April accounted for 20% of annual landings of red grouper off these states during those three most recent fully open fishing years. Assuming no temporal redistribution of effort, relative to this status quo closure, **Sub-alternative 2a** would eliminate an additional 12% of annual landings. **Sub-alternative 2b** would eliminate an additional 8% of annual landings. **Sub-alternative 2c** would eliminate an additional 18% of annual landings. The assumption that there will be no temporal redistribution of fishing effort appears substantiated by the SEFSC Commercial ACL data (accessed October 2017). **Figure 26** clearly shows that the elimination of four months of fishing substantially reduced the annual landings of red grouper off NC and SC, and this decline has persisted through time.

Expanded estimates of commercial discards for shallow-water grouper from the SEFSC Supplemental Commercial Discard Logbook (accessed May 2017) are provided in **Figure S-7**.

Action 9. Remove the commercial minimum size limits for deep-water species

- **Alternative 1 (No Action)**. The commercial minimum size limit for queen snapper, silk snapper, and blackfin snapper in the South Atlantic EEZ is 12 inches total length (TL).
- **Alternative 2**. Remove the 12-inch TL commercial minimum size limit for queen snapper, silk snapper, and blackfin snapper in South Atlantic federal waters.

The current commercial size limit of 12 inches TL for queen snapper, silk snapper, and blackfin snapper was established in Amendment 9 (1998). It was difficult to determine the effects of Alternative 2 due to the lack of commercial discard data available. The only discard data available for the years 2014-2016 was from the SEFSC Supplemental Discard Logbook Program. The discard logbook database (accessed May 2017) contains self-reported discard reports from a 20 percent sub-sample (by region and gear fished) of all commercial vessels with federal fishing permits. From 2014-2016, only two trips reported discards for silk snapper and no discards were reported for queen snapper and blackfin snapper (**Table 20**). None of the three species were reported as kept for bait. For the only trips with reported discards for any of the three species, five silk snapper were discarded alive due to the local or federal size limit forbidding it. Barotrauma likely results in high fishing mortality of discards due to the relatively deep depth of capture for these species. Expanding the observed discard rates to the fishery as a whole is non-informative due to low reported encounters in recent years (**Figure S-8**). Available data suggests minimal changes in discard or harvest rates would be expected under Alternative 2. The reliability of this analysis is dependent upon the accuracy of the underlying data and input assumptions.

Action 10. Decrease the commercial minimum size limit for gray triggerfish off the east coast of Florida

- **Alternative 1 (No Action)**. The commercial minimum size limit for gray triggerfish in the South Atlantic federal waters off the east coast of Florida is 14 inches fork length (FL). The commercial minimum size limit for gray triggerfish in the federal waters off Georgia, South Carolina, and North Carolina is 12 inches FL.
- **Alternative 2**. Decrease the commercial minimum size limit for gray triggerfish in the federal waters off the east coast of Florida to 12 inches FL.

NOTE: Consider an alternative that would increase the MSL from 12 to 14 inches off GA, SC and NC. The Gulf Council is considering increasing the MSL to 15 inches as Gulf gray trigger is undergoing overfishing.

The South Atlantic Fishery Management Council recently modified the gray triggerfish minimum size limit for the commercial sector in federal waters off the east coast of Florida in Amendment 29, effective July 1, 2015. This amendment raised the minimum size limit in federal waters off the east coast of Florida from 12 inches total length (TL) to 14 inches FL. To evaluate the effects of lowering the current minimum size limit, commercial catch data collected by the Southeast Fisheries Science Center's (SEFSC) Trip Intercept Program (TIP) prior to the current rule were used to determine the proposed impact. Only gray triggerfish harvested from January 2014 through June 2015 by the commercial sector in federal waters off east Florida were used in the analyses.

TIP recorded 2,616 gray triggerfish for this area and time period after eliminating a small number of outliers (FL < 4 inches). All lengths were converted to inches FL using standard conversion factors and equations used in SEDAR 41 (2016). The size limit analysis estimated the percent increase in landings in federal waters off the east coast of Florida if the current 14-inch FL size limit was reduced during this time, thus the weight of each fish was required. When whole weight data was available it was used, and gutted weights were converted using the SEFSC conversion factor of 1.04. When weight data was unavailable, it was estimated from length using the gray triggerfish weight-length equations defined in SEDAR 41 (2016).

Figure 27 provides the commercial gray triggerfish landings length distribution in 1-inch increments from January 2014 to June 2015 from federal waters off the east coast of Florida. The majority of the gray triggerfish landed were above the current minimum size limit of 14 inches FL. Lowering the current size limit to 12 inches FL (Alternative 2) would result in approximately 20% additional gray triggerfish available for harvest. This is consistent with recent analyses from Amendment 29 that reported between 11% and 26% of the mean monthly landings were less than 14 inches FL in the South Atlantic from 2007-2012. Alternative 2 would also likely reduce discards when the season was open, but may increase harvest rates, possibly shortening the commercial fishing seasons. Quota closures have been implemented for gray triggerfish every year since 2012.

The percent increases in landings in weight were calculated for minimum size limits (MSL) at 1-inch intervals between 12-14 inches FL as follows:

$$\left(\frac{(Current\ Catch + \ Additional\ Catch)}{Current\ Catch}\right) * 100$$

where:

> $Current\ Catch$ = *catch in pounds with a MSL of 14-inch FL*
> $Additional\ Catch$ = *catch in pounds of fish that are less than the MSL of 14-inch FL and greater than or equal to the reduced MSL*

Data were pooled for the time with the assumption that recent lengths will likely reflect future lengths harvested in the fishery for federal waters off the east coast of Florida. All of the weights used in the analysis are in pounds whole weight. Similar to the length distribution, lowering the size limit to 12 inches FL would likely increase the rate of fish harvested, thus increasing the landings in federal waters off the east coast of Florida and shortening the current commercial seasons (**Table 21**). It is likely the majority of the undersized fish currently being discarded are surviving since SEDAR 41 (2016) estimated a relatively low discard mortality of 12.5%. The reliability of this analysis is dependent upon the accuracy of the underlying data and input assumptions.

References

Box GE, Jenkins GM, Reinsel GC, Ljung GM. 2013. Time series analysis: forecasting and control. John Wiley & Sons.

Farmer NA, Froeschke JT. 2015. Forecasting for recreational fisheries management: What's the catch? NAJFM, 35(4):720-735.

SEDAR 41. 2016. SEDAR 41 – South Atlantic Gray Triggerfish Assessment Report. SEDAR, North Charleston, SC. 428 pp. http://sedarweb.org/sedar-41.

SEDAR 49. 2016. SEDAR 49 – Gulf of Mexico Data-limited Species. SEDAR, North Charleston, SC. 618 pp. http://sedarweb.org/sedar-49.

Table 1. Blueline tilefish recent landings and quota closures.

Fishing Year	Current Landings	ACL	%ACL	Closure Date
2017	86,507	87,521	98.84	7/18/17; Reopened 10/24/17-11/1/17
2016	97,798	87,521	111.74	6/1/16; reopened 7/13/16, closed 8/30/16
2015	78,303	17,841	438.89	4/7/2015
2014	156,371	112,207	139.36	6/23/2014

Source: SERO ACL Monitoring Webpage [accessed 2/6/18].

Table 2. Projected blueline tilefish commercial trip limit scalars, by month, based on most recent three years without a quota closure.

Month	500-lb	400-lb	300-lb	250-lb	200-lb	150-lb	100-lb	Years
1	130%	116%	100%	90%	79%	66%	51%	2013-2015
2	125%	113%	100%	92%	82%	70%	56%	2013-2015
3	138%	120%	100%	89%	76%	63%	48%	2012*-2014
4	137%	120%	100%	89%	78%	65%	51%	2012*-2014
5	139%	120%	100%	89%	78%	65%	52%	2012-2014
6	139%	120%	100%	90%	79%	67%	53%	2012*-2014
7	146%	123%	100%	88%	75%	62%	47%	2011-2013
8	146%	124%	100%	87%	74%	60%	45%	2011-2013
9	151%	126%	100%	87%	73%	58%	42%	2010, 2011, 2013
10	149%	125%	100%	87%	73%	58%	43%	2010, 2011*, 2013*
11	149%	125%	100%	87%	73%	58%	43%	2010*, 2011*, 2013*
12	148%	125%	100%	87%	73%	59%	44%	2010*, 2011*, 2013*

*Some months aggregated to achieve sample size of n>30.

Table 3. Projected mean and 95% lower and upper (L95, U95) confidence limits quota closure dates for blueline tilefish under different alternatives proposed for Action 1. Blanks denote no projected quota closure.

		Mean 2014-2016			SARIMA		
Alternative	**Season**	**L95**	**MEAN**	**U95**	**L95**	**MEAN**	**U95**
Alt 1	Jan-Dec		7-Jul	22-Apr		13-Jul	2-May
Alt 2a	Jan-June		12-Jun	28-Mar		25-Jun	7-Apr
	July-Dec		11-Aug	27-Jul		9-Aug	30-Jul
Alt 2b	Jan-June		14-May	20-Mar		25-May	19-Mar
	July-Dec		11-Aug	27-Jul		9-Aug	30-Jul
Alt 3a	Jan-Dec		30-Jul	16-Jun		27-Jul	14-Jun
Alt 3b	Jan-Dec		24-Jul	4-Jun		23-Jul	30-May
OLD Alt 3c*	Jan-Dec		20-Jul	9-Jun		18-Jul	5-Jun
NEW Alt 3c	Jan-Dec		8-Aug	6-Jul		8-Aug	8-Jul

**considered but rejected*

Table 4. Snowy grouper recent landings and quota closures.

Year	Landings	ACL	Units	%ACL	Closure
2017	136,561	135,380	gw	100.87	6/22/17
2016	151,999	125,760	gw	120.86	6/14/2016
2015	131,063	115451	gw	113.52	9/22/2015
2014	94,491	82900	gw	113.98	7/25/2014
2013	79,695	82900	gw	96.13	8/10/2013
2012	89,413	82900	gw	107.53	12/19/2012
2011	37,461	82900	gw	45.19	
2010	86,692	82900	gw	104.57	
2009	75,614	82900	gw	91.21	
2008	72,971	84000	gw	86.87	
2007	112,385	118000	gw	95.24	
2006	214,064	151000	gw	141.76	10/23/2006
2005	206,636	344508	gw	59.98	
2004	220,958	344508	gw	64.14	

Source: SERO ACL Monitoring Webpage [accessed 2/6/18].

Table 5. Projected mean and 95% lower and upper (L95, U95) confidence limits quota closure dates for snowy grouper under different alternatives proposed for Action 2. Blanks denote no projected quota closure.

Alternative	Season	L95	MEAN	U95	L95	MEAN	U95
Alt 1	Jan-Dec		21-Sep	1-Jul	7-Nov	19-Mar	14-Feb
Alt 2	Jan-June		21-Jun	8-May		18-Feb	27-Jan
	July-Dec		26-Sep	26-Sep	7-Nov	28-Jul	15-Jul
Alt 3	Jan-June			21-May		25-Feb	31-Jan
	July-Dec		21-Sep	14-Sep	7-Nov	21-Jul	11-Jul

Table 6. Greater amberjack recent landings and quota closures.

Fishing Year	Total Landings	ACL	Units	ACL	Closure Date
March 1, 2017 – February 28, 2018	796,206	769,388	gw	103.5	10/18/17; April 1-30 SEASONAL CLOSURE
March 1, 2016 – February 28, 2017	748,950	769,388	gw	97.34	10/4/2016
March 1, 2015 - Feb 28, 2016	709,130	769,388	gw	92.17	1/21/2016
May 1, 2014 - Feb 28, 2015	754,429	769,388	gw	98.06	
May 1, 2013 - April 30, 2014	882,127	800,163	ww	110.24	
May 1, 2012 - April 30, 2013	972,308	800,163	ww	121.51	
May 1, 2011 - April 30, 2012	1,032,080	1,169,931	gw	88.22	
May 1, 2010 - April 30, 2011	857,838	1,169,931	gw	73.32	
May 1, 2009 - April 30, 2010	837,079	1,169,931	gw	71.55	
May 1, 2008 - April 30, 2009	648,250	1,169,931	gw	55.41	
May 1, 2007 - April 30, 2008	542,438	1,169,931	gw	46.36	

Source: SERO ACL Monitoring Webpage [accessed 2/6/18].

Table 7. Projected greater amberjack commercial trip limit scalars, by month, based on most recent three years without a quota closure.

Month	1200-lb	1000-lb	750-lb	600-lb	500-lb	350-lb	200-lb	Years
1	98.4	94.4	86.3	78.5	72.3	59.8	42.1	2013-2015
2	97.1	92.8	83.7	75.8	69.1	56.2	38.6	2013-2015
3	98.3	91.3	77.7	67.4	59.6	46.0	30.0	2014-2016
4	97.7	90.9	77.9	67.9	60.2	46.8	30.7	(2014-2016)*
5	97.4	90.6	78.0	68.2	60.6	47.3	31.2	2014-2016
6	99.1	94.2	84.6	76.3	69.5	57.2	40.4	2014-2016
7	99.2	95.3	87.1	79.6	73.0	60.7	44.0	2014-2016
8	99.3	95.1	84.6	75.8	68.7	55.8	39.0	2014-2016
9	98.8	93.9	84.7	76.8	70.1	57.4	40.3	2014-2016
10	98.9	94.3	83.9	75.0	67.8	54.7	37.3	2013-2015
11	95.0	89.1	77.2	67.6	60.4	47.5	31.7	2013-2015
12	98.1	92.1	79.0	68.3	60.2	46.6	30.8	2013-2015

*Some months aggregated to achieve sample size of n>30.

Table 8. Projected greater amberjack commercial closure dates under proposed alternatives. Note blank denotes no closure.

		MEAN 2014-2016			SARIMA		
Alternative	**Season**	**L95**	**MEAN**	**U95**	**L95**	**MEAN**	**U95**
Alt 1	Mar-Feb		8-Nov	30-Sep		27-Jul	21-May
Alt 2a	Mar-Aug	8-Jul	10-Jun	28-May		17-May	28-Mar
	Sept-Feb					16-Dec	4-Oct
Alt 2b	Mar-Aug	27-Jul	21-Jun	4-Jun		21-May	31-Mar
	Sept-Feb					28-Dec	6-Oct
Alt 2c	Mar-Aug	27-Jul	21-Jun	4-Jun		21-May	31-Mar
	Sept-Feb					16-Dec	4-Oct
Alt 2d	Mar-Aug	10-Aug	5-Jul	16-Jun		27-May	3-May
	Sept-Feb					30-Dec	7-Oct
Alt 3a	Mar-Aug	8-Jul	10-Jun	28-May		17-May	28-Mar
	Sept-Feb			13-Jan		22-Nov	27-Sep
Alt 3b	Mar-Aug	27-Jul	21-Jun	4-Jun		21-May	31-Mar
	Sept-Feb					16-Dec	3-Oct
Alt 3c	Mar-Aug	27-Jul	21-Jun	4-Jun		21-May	31-Mar
	Sept-Feb			12-Jan		21-Nov	27-Sep
Alt 4a	Mar-Feb		26-Dec	14-Oct		12-Aug	26-May
Alt 4b	Mar-Feb		27-Feb	5-Nov		2-Sep	1-Jun

Table 9. Red porgy recent landings and quota closures.

Year	Landings	ACL	Units	%ACL	Closure
2017	114,874	164,000	ww	70.05	
2016	120,104	164,000	ww	73.23	
2015	146,056	164,000	ww	89.06	
2014	155,743	154,500	ww	100.68	
2013	163,337	153,000	gw	106.76	12/02/13
2012	155,743	190,050	gw	81.95	
2011	195,215	190,050	gw	102.72	
2010	152,743	190,050	gw	80.37	
2009	158,219	190,050	gw	83.25	
2008	165,365	127,000	gw	130.21	
2007	138,737	127,000	gw	109.24	
2006	80,619	127,000	gw	63.48	
2005	46,821	None	gw		
2004	47,814	None	gw		

Source: SERO ACL Monitoring Webpage [accessed 2/6/18].

NEW Table 10. Mean weight of landed red porgy intercepted on commercial trips by the Trip Interview Program. Note FL and GA 2006-2016 have been pooled due to low sample sizes off GA.

<table>
<tr><th>Year</th><th>FL</th><th>GA</th><th>SC</th><th>NC</th></tr>
<tr><td>1995</td><td>1.93</td><td>1.49</td><td>1.60</td><td>1.84</td></tr>
<tr><td>1996</td><td>1.92</td><td>1.42</td><td>1.60</td><td>1.76</td></tr>
<tr><td>1997</td><td>1.89</td><td>1.49</td><td>1.65</td><td>1.77</td></tr>
<tr><td>1998</td><td>1.86</td><td>1.34</td><td>1.56</td><td>1.59</td></tr>
<tr><td>1999</td><td>1.82</td><td>1.83</td><td>1.74</td><td>2.06</td></tr>
<tr><td>2000</td><td>1.97</td><td>2.01</td><td>2.25</td><td>1.91</td></tr>
<tr><td>2001</td><td>2.21</td><td>1.88</td><td>2.19</td><td>2.03</td></tr>
<tr><td>2002</td><td>1.95</td><td>2.14</td><td>2.18</td><td>2.24</td></tr>
<tr><td>2003</td><td>2.26</td><td>2.21</td><td>2.19</td><td>2.09</td></tr>
<tr><td>2004</td><td>2.67</td><td>2.49</td><td>2.12</td><td>2.14</td></tr>
<tr><td>2005</td><td>2.57</td><td>2.76</td><td>2.13</td><td>2.17</td></tr>
<tr><td>2006</td><td colspan="2">2.38</td><td>2.14</td><td>1.68</td></tr>
<tr><td>2007</td><td colspan="2">2.70</td><td>2.07</td><td>1.82</td></tr>
<tr><td>2008</td><td colspan="2">2.66</td><td>2.20</td><td>1.78</td></tr>
<tr><td>2009</td><td colspan="2">3.45</td><td>2.09</td><td>1.69</td></tr>
<tr><td>2010</td><td colspan="2">5.05</td><td>2.15</td><td>1.86</td></tr>
<tr><td>2011</td><td colspan="2">5.26</td><td>2.31</td><td>1.82</td></tr>
<tr><td>2012</td><td colspan="2">4.69</td><td>2.33</td><td>1.72</td></tr>
<tr><td>2013</td><td colspan="2">4.24</td><td>2.13</td><td>1.66</td></tr>
<tr><td>2014</td><td colspan="2">2.42</td><td>2.06</td><td>1.85</td></tr>
<tr><td>2015</td><td colspan="2">2.10</td><td>2.24</td><td>1.76</td></tr>
<tr><td>2016</td><td colspan="2">2.07</td><td>2.16</td><td>1.91</td></tr>
</table>

Table 11. Projected mean and 95% lower and upper (L95, U95) confidence limits for quota closure dates for red porgy under different alternatives proposed for Action 4. Blank cells denote no anticipated quota closure.

		MEAN 2014-2016			**SARIMA**		
Alternative	**Season**	L95	**MEAN**	U95	L95	**MEAN**	U95
Alt 1	Jan-Dec			11-Nov			23-Jul
Alt 2a	Jan-Apr			29-Apr			8-Mar
	May-Dec		**6-Nov**	25-Aug			2-Jul
Alt 2b	Jan-Apr			3-Apr			20-Feb
	May-Dec		**2-Oct**	25-Aug			2-Jul
Alt 2c	Jan-Apr		**22-Apr**	20-Mar			13-Feb
	May-Dec		**25-Sep**	25-Aug			2-Jul
Alt 3a	Jan-Apr						24-Apr
	May-Dec		**6-Nov**	24-Aug			15-Jun
Alt 3b	Jan-Apr						28-Mar
	May-Dec		**2-Oct**	9-Aug			15-Jun
Alt 3c	Jan-Apr						13-Mar
	May-Dec		**19-Sep**	29-Jul			15-Jun
Alt 4	Jan-Dec		**24-Aug**	6-Jul			18-Apr

Table 12. Vermilion snapper recent landings and quota closures.

Fishing Year	Landings	ACL	Units	ACL	Trip Limit	Closure
January 1 -June 30, 2017	410,786	431,460	ww	95.21	3/22/2017	5/17/17
July 1 - Dec 31, 2017	465,905	431,460		103.05	10/2/17	10/17/17
January 1 - June 30, 2016	393,911	431,460	ww	91.3	3/2/2016	3/29/2016
July 1 - Dec 31, 2016	393,506	432,305		91.0	8/28/2016	10/11/16; reopened 12/14-12/15/16
Jan 1 - June 30, 2015	431,760	438,260		98.5	3/2/2015	4/15/2015
July 1 - Dec 31, 2015	452,519	438,260		103.3	9/10/2015	9/22/2015
Jan 1 - June 30, 2014	463,881	446,080		104.0	3/11/2014	4/19/2014
July 1 - Dec 31, 2014	461,061	446,080		103..4	8/23/2014	9/12/2014
Jan 1 - June 30, 2013	312,150	466,480		66.9		2/13/2013
July 1 - Dec 31, 2013	665,613	613,278		108.5		12/2/2013
Jan 1 - June 30, 2012	395,733	315,523	gw	125.4		2/29/2012
July 1 - Dec 31, 2012	499,980	302,523		165.3		9/28/2012
Jan 1 - June 30, 2011	331,418	315,523		105.0		3/10/11; Re-opened 5/1/11-5/8/11
July 1 - Dec 31, 2011	585,742	302,523		193.6		9/30/2011
Jan 1 - June 30, 2010	356,823	315,523		113.1		3/19/2010
July 1 - Dec 31, 2010	520,067	302,523		171.9		10/6/2010
Jan 1 - June 30, 2009	421,831	315,523		133.7		
July 1 - Dec 31, 2009	406,166	302,523		134.3		9/18/2009

Source: SERO ACL Monitoring Webpage [accessed 2/6/18].

Table 13. Projected vermilion snapper commercial trip limit scalars, by month, based on most recent three years without a quota closure.

Month	500	700	750	850	1000	Years
1	60%	78%	83%	90%	100%	2014-2016
2	62%	80%	84%	91%	100%	2014-2016
3	71%	85%	88%	93%	100%	2007-2009
4	70%	85%	88%	93%	100%	2007-2009
5	74%	87%	90%	94%	100%	2007-2009
6	76%	89%	91%	95%	100%	2007-2009
7	64%	82%	86%	92%	100%	2014-2016
8	63%	80%	84%	91%	100%	2012-2013, 2015
9	64%	81%	85%	92%	100%	2008, 2010, 2013
10	69%	84%	87%	93%	100%	2006-2008
11	68%	84%	87%	93%	100%	2006-2008
12	72%	86%	89%	94%	100%	2006-2008

Table 14. Projected mean and 95% lower and upper (L95, U95) confidence limits trip limit reduction and quota closure dates for vermilion snapper under different alternatives proposed for Action 5. Note, Alternatives 2-3 do not have trip limit reductions in Season 2, and Alternative 4 does not have trip limit reductions for either Season.

	TRIP LIMIT REDUCED					
Season 1	**Last 3 Years**			**SARIMA**		
Alt	L95_Last3	**Last3**	U95_Last3	L95_SARIMA	**SARIMA**	U95_SARIMA
1	28-Mar	**4-Mar**	20-Feb	27-May	**27-Feb**	6-Feb
2	28-Mar	**4-Mar**	20-Feb	27-May	**27-Feb**	6-Feb
3	28-Mar	**4-Mar**	20-Feb	27-May	**27-Feb**	6-Feb
Alt	**FISHERY CLOSED**					
1	27-Apr	**31-Mar**	14-Mar		**29-Apr**	26-Feb
2	27-Apr	**31-Mar**	14-Mar		**29-Apr**	26-Feb
3	27-Apr	**31-Mar**	14-Mar		**29-Apr**	26-Feb
4a	19-Apr	**24-Mar**	7-Mar	23-Jun	**14-Apr**	19-Feb
4b	26-Apr	**31-Mar**	13-Mar		**27-Apr**	24-Feb
4c	5-May	**7-Apr**	21-Mar		**6-May**	7-Mar
	TRIP LIMIT REDUCED					
Season 2	**Last 3 Years**			**SARIMA**		
Alt	L95_Last3	**Last3**	U95_Last3	L95_SARIMA	**SARIMA**	U95_SARIMA
1	18-Sep	**25-Aug**	13-Aug	4-Oct	**22-Aug**	4-Aug
Alt	**FISHERY CLOSED**					
1	25-Oct	**17-Sep**	31-Aug		**16-Sep**	23-Aug
2	1-Nov	**20-Sep**	1-Sep		**19-Sep**	25-Aug
3	18-Dec	**14-Oct**	19-Sep		**12-Oct**	11-Sep
4a	13-Oct	**9-Sep**	24-Aug	14-Nov	**7-Sep**	16-Aug
4b	23-Oct	**14-Sep**	28-Aug	28-Dec	**13-Sep**	20-Aug
4c	8-Nov	**23-Sep**	4-Sep		**22-Sep**	27-Aug

Table 15. Jacks complex recent landings and quota closures.

Fishing Year	Current Landings	ACL	Units	ACL	Closure Date
2017	189,033	189,422	ww	99.79	8/4/17
2016	203,052	189,422	ww	107.20	8/9/2016
2015	187,189	189,422	ww	98.82	6/23/2015
2014	236,453	189,422	ww	124.83	7/15/2014
2013	205,947	189,422	ww	108.72	6/18/2013
2012	333,590	193,999	ww	171.95	7/2/2012

Source: SERO ACL Monitoring Webpage [accesses 2/6/18].

Table 16. Projected Jacks complex commercial trip limit scalars, by month, based on most recent three years without a quota closure.

Trip Limit (gw)	1	2	3	4	5	6	7	8	9	10	11	12
500	95%	93%	92%	59%	86%	71%	83%	87%	79%	83%	83%	85%
400	94%	90%	89%	53%	80%	66%	78%	82%	75%	78%	78%	80%
300	91%	86%	84%	45%	71%	58%	71%	75%	69%	71%	71%	71%
250	88%	82%	80%	41%	65%	53%	67%	70%	65%	67%	66%	66%
200	84%	78%	75%	36%	58%	47%	61%	65%	60%	62%	60%	58%
150	77%	70%	67%	30%	49%	39%	53%	58%	53%	54%	52%	49%
Years Used:	2014-2016	2014-2016	2014-2016	2014-2016	2014-2016	2012, 2014, 2016	2010, 2011, 2016	2009, 2010, 2011	2009, 2010, 2011	2009, 2010, 2011	2009, 2010, 2011	2009, 2010, 2011

Source: SEFSC Commercial Logbook (Nov 2017).
Note: Trip limit scalars relative to total pounds (whole weight) landed on trip, as projections and ACL are in whole weight.

Table 17. Projected mean and 95% lower and upper (L95, U95) confidence limits for quota closure dates for Jacks complex under different alternatives proposed for Action 6.

	Overage Date					
	Last 3 Years			SARIMA		
Alt	**L95**	**Mean**	**U95**	**L95**	**Mean**	**U95**
1	14-Dec	3-Jul	5-Jun		12-Jun	24-Apr
2a		12-Aug	7-Jul		25-Jul	18-May
2b		27-Aug	13-Jul		6-Aug	24-May
2c		19-Sep	25-Jul		27-Aug	4-Jun
3a		1-Aug	30-Jun		14-Jul	11-May
3b		13-Aug	6-Jul		23-Jul	15-May
3c		3-Sep	16-Jul		11-Aug	22-May

Table 18. The estimated percent decrease in commercial almaco jack landings at 2-inch intervals between 20 – 26 inches FL. The decreases were generated with TIP data from 2014 – 2016 from a sample of 3,587 fish.

Alternative	Minimum Size Limit (inches FL)	Percent Decrease in Landings
2a	20	11.5%
2b	22	17.4%
2c	24	25.4%
2d	26	34.2%

Table 19. Total landings (pounds whole weight) and mean monthly percentage of commercially landed red grouper reported by dealers in South Carolina and North Carolina for the three years prior to the implementation of the January-April shallow-water grouper closure.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2006	15,880	11,320	10,481	14,237	33,499	36,301	35,635	44,558	32,216	29,058	27,289	24,203
2007	15,588	12,131	37,911	39,846	69,021	85,124	69,485	85,159	32,386	49,730	37,496	50,253
2008	41,456	38,306	29,155	43,194	86,630	99,013	60,623	73,510	43,316	53,222	36,007	28,080
Mean	24,308	20,586	25,849	32,426	63,050	73,479	55,248	67,742	35,973	44,003	33,597	34,179
	5%	4%	5%	6%	12%	14%	11%	13%	7%	9%	7%	7%

Table 20. The number of self-reported discards reported to the coastal logbook program from 2014-2016 for the South Atlantic for queen, silk, and blackfin snapper.

Species	Number Discarded	Discard Condition	Discard Reason
Queen Snapper	0	———	———
Silk Snapper	5	All Alive	Size Limit
Blackfin Snapper	0	———	———

Table 21. The estimated percent increase in landings of commercial gray triggerfish landings from federal waters off the east coast of Florida at 1-inch intervals between 12-14 inches FL. The increases were generated with TIP data from January 2014 to June 2015 from a sample of 2,616 fish.

Minimum Size Limit (Inches FL)	Percent Increase in Landings
12	17.9%
13	11.4%
14	0.0%

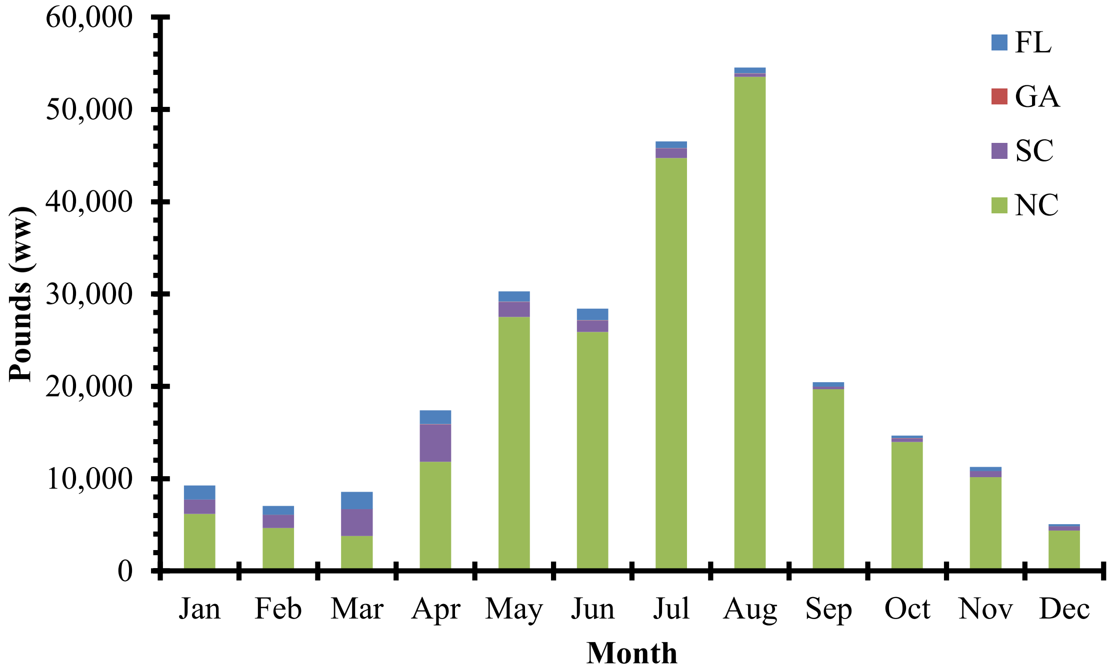


Figure 1. The average monthly South Atlantic blueline tilefish landings by state from 2004-2013 in pounds whole weight. The years 2014-2016 were excluded due to closures. Source: Southeast Fisheries Science Center commercial (5/2/2017) ACL dataset.

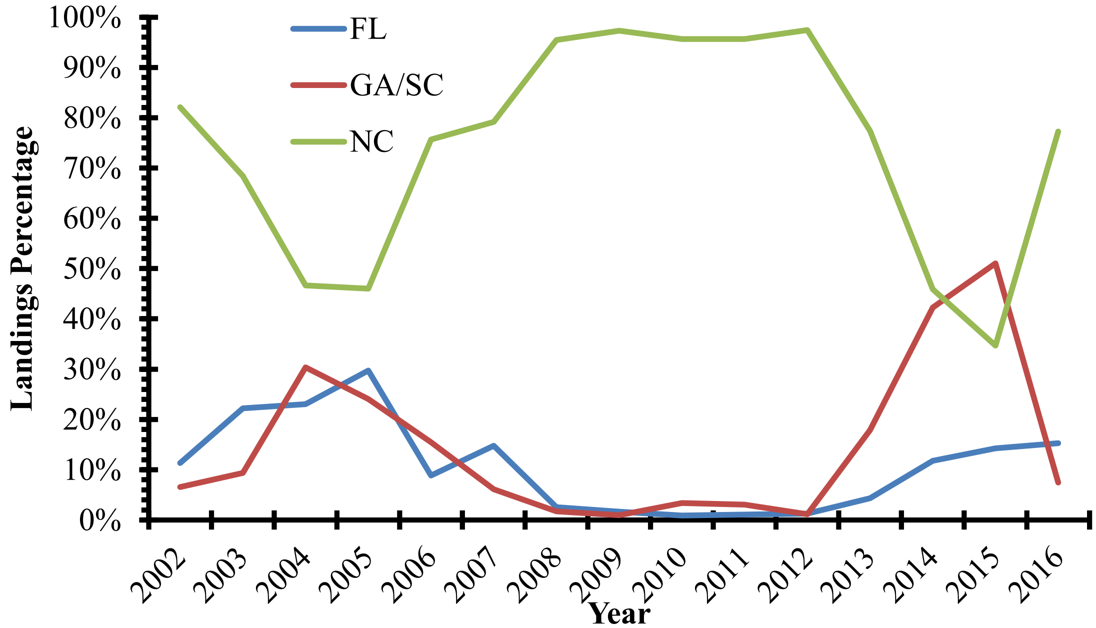


Figure 2. The percentage of annual South Atlantic blueline tilefish landings by state from 2002-2016. Georgia and South Carolina were combined due to confidentiality concerns. Source: Southeast Fisheries Science Center commercial (5/2/2017) ACL dataset.

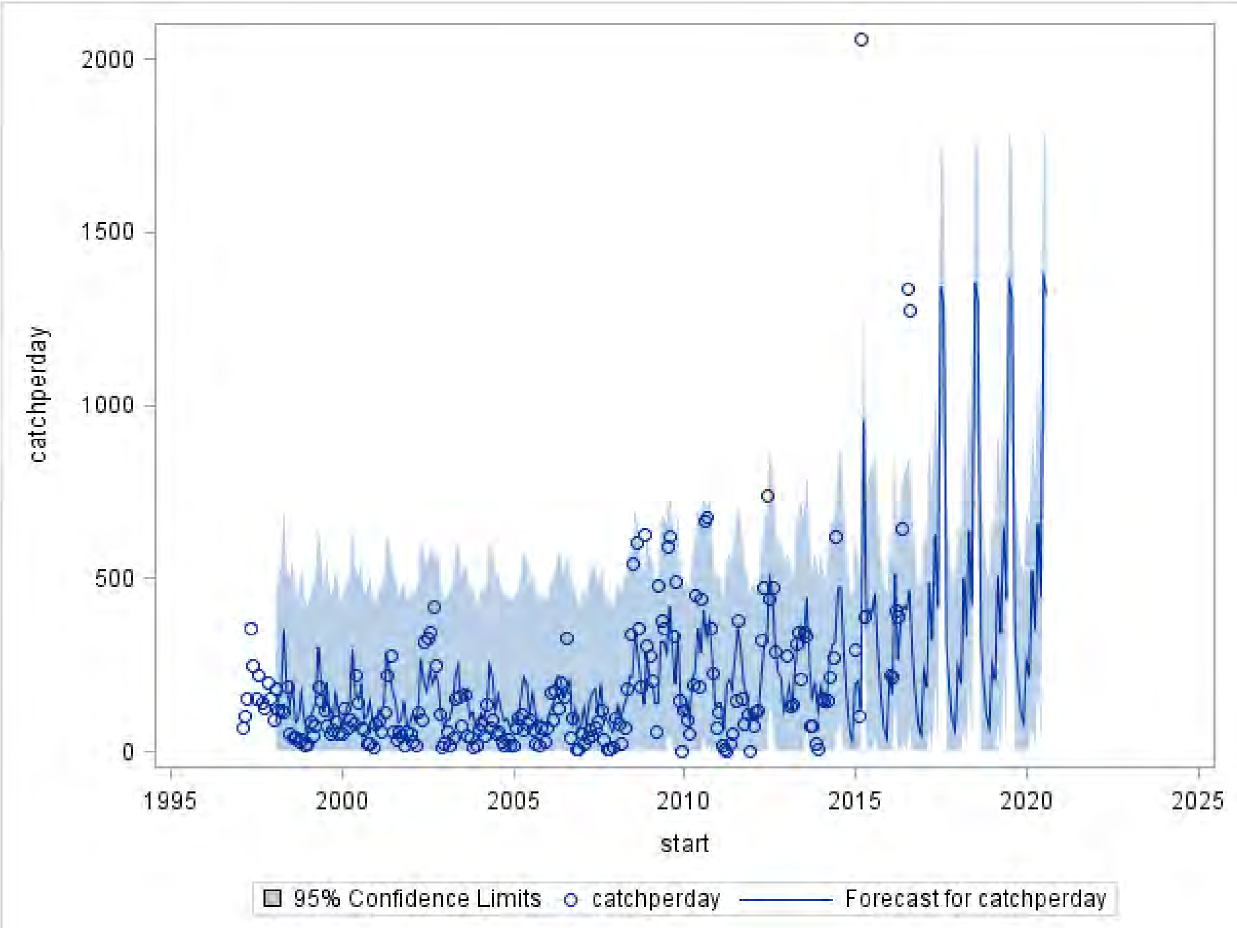


Figure 3. Final SARIMA model fit for blueline tilefish monthly commercial landings (lb ww) per open day.

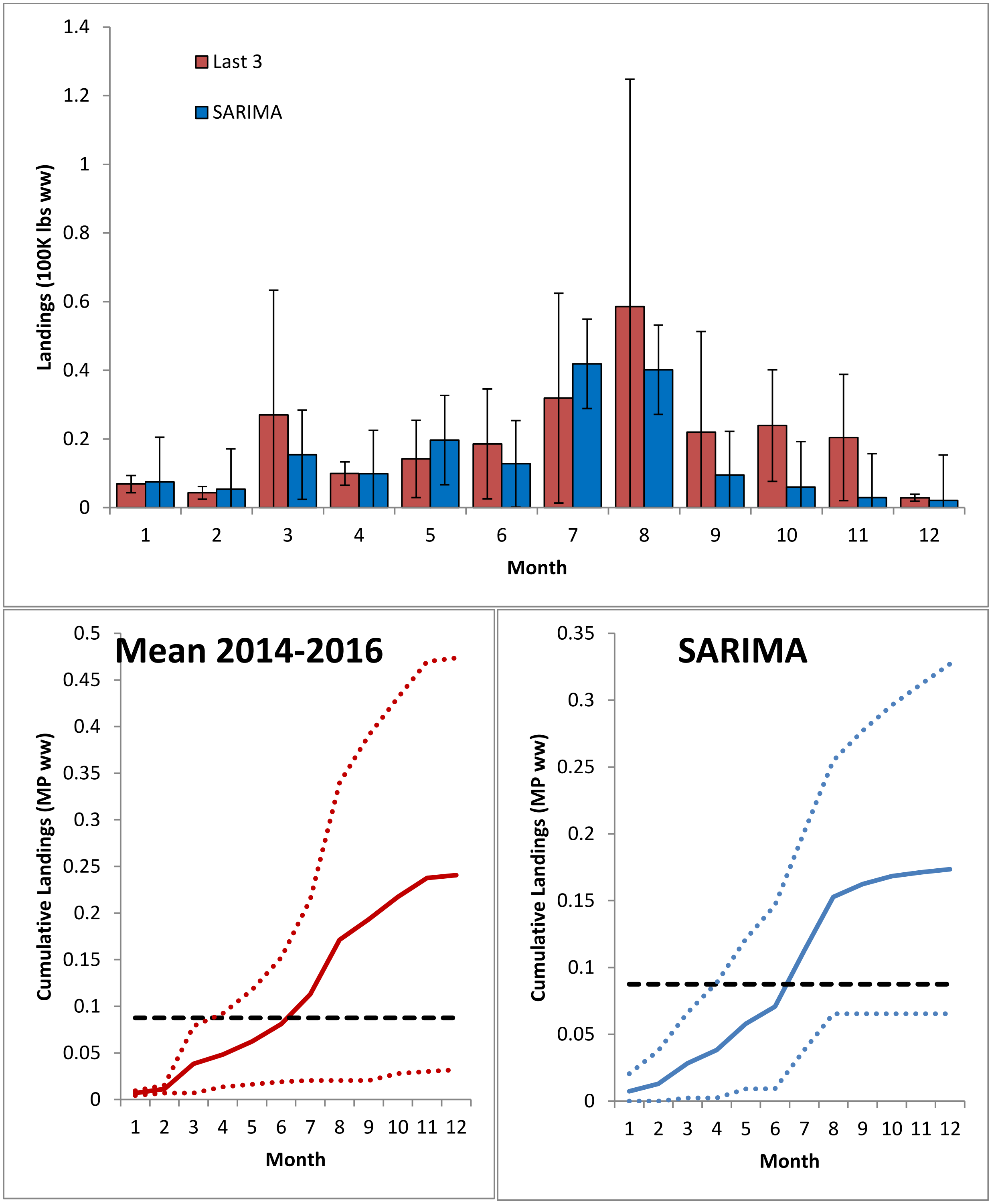


Figure 4. Blueline tilefish projected commercial landings (MP: million pounds, whole weight) by month (top) and mean (solid line) and 95% confidence limits (dotted lines) estimates for cumulative landings relative to ACL (bottom) for two projection models: Mean of last 3 years (2014-2016) and SARIMA.

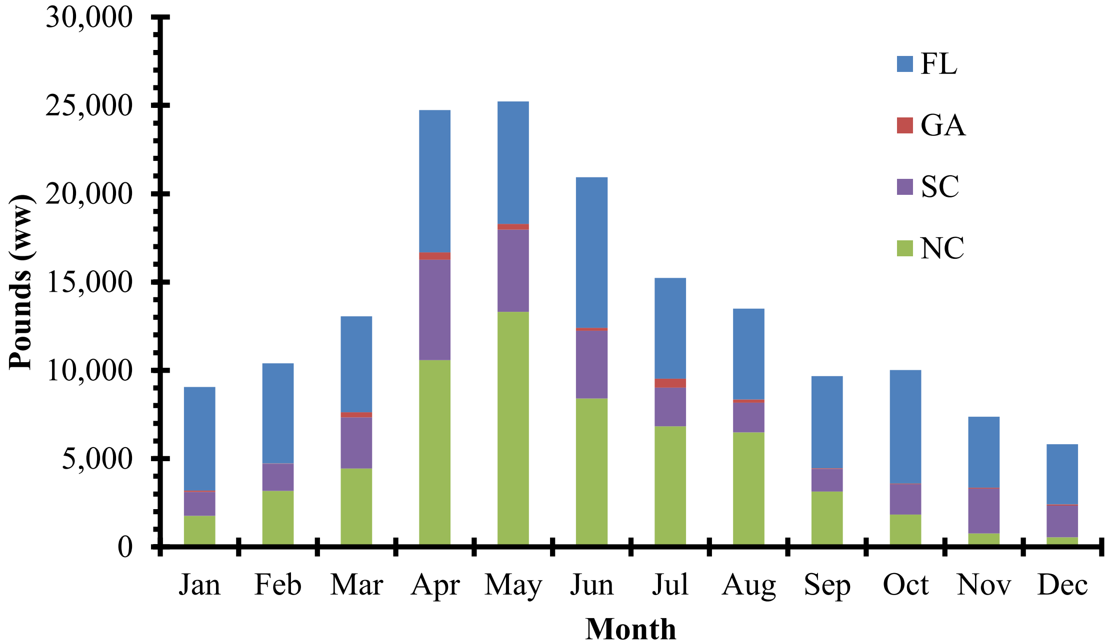


Figure 5. The average monthly South Atlantic snowy grouper landings by state from 2002-2005 and 2007-2011 in pounds whole weight. The years 2006 and 2012-2016 were excluded due to closures. Source: Southeast Fisheries Science Center commercial (5/2/2017) ACL dataset.

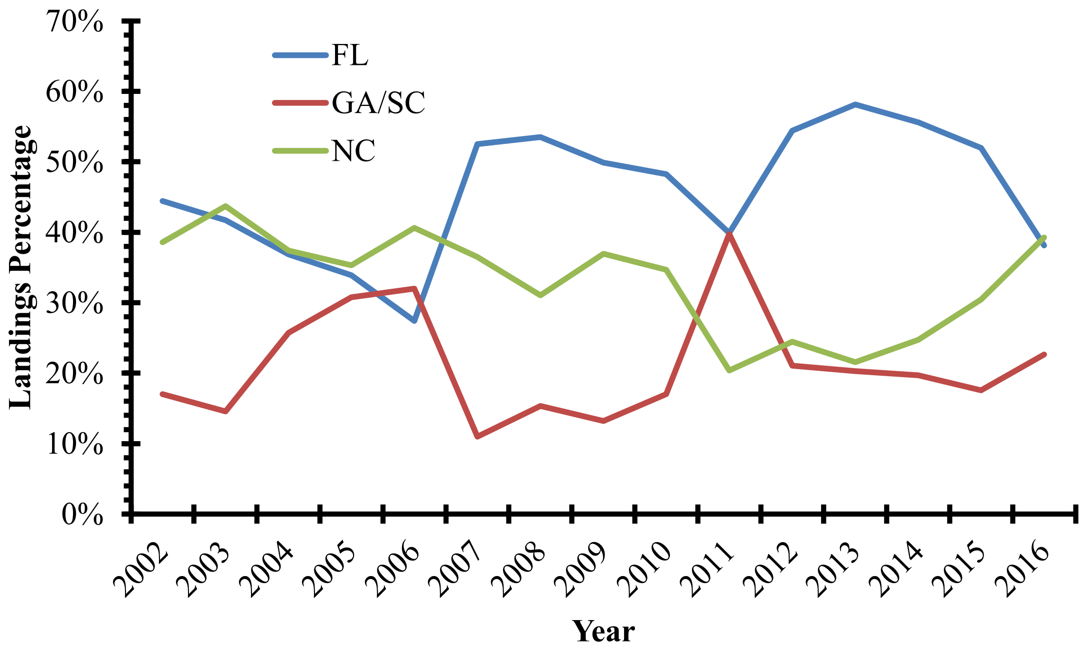


Figure 6. The percentage of annual South Atlantic snowy grouper landings by state from 2002-2016. Georgia and South Carolina were combined due to confidentiality concerns. Source: Southeast Fisheries Science Center commercial (5/2/2017) ACL dataset.

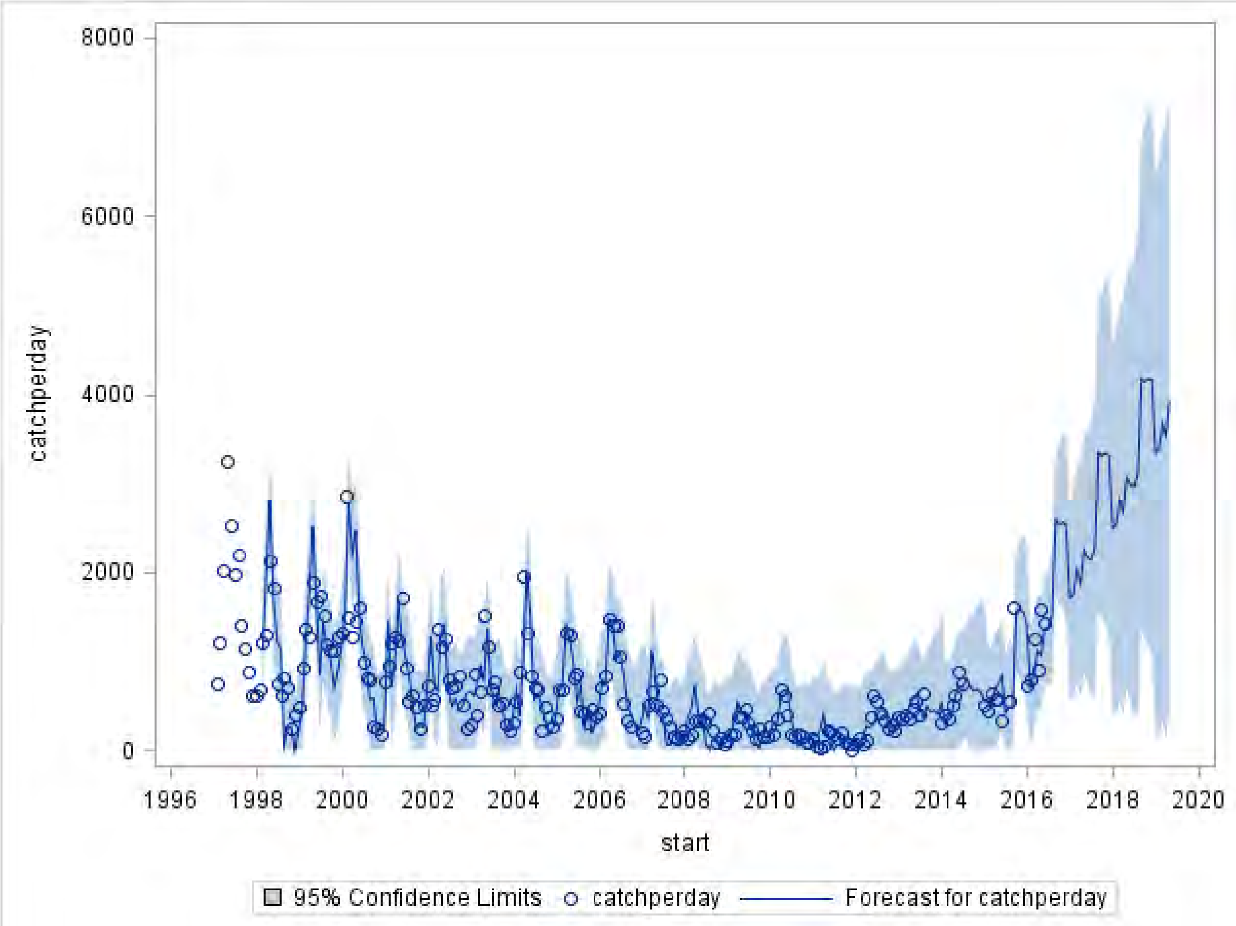


Figure 7. Final SARIMA model fit for snowy grouper monthly commercial landings (lb ww) per open day.

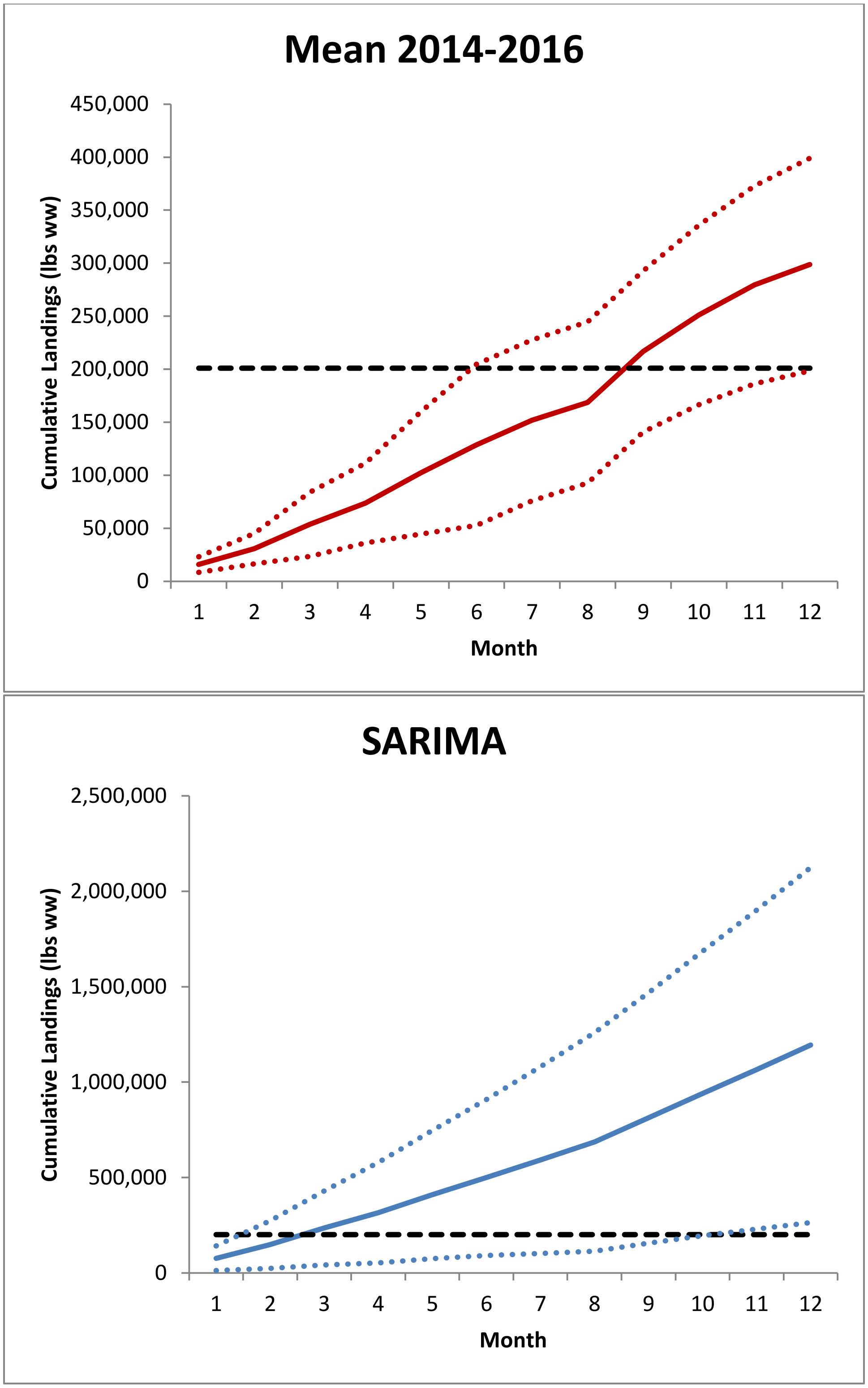


Figure 8. Mean (solid line) and 95% confidence limits (dotted lines) for Snowy grouper projected cumulative landings relative to ACL under two projection models: Mean of last 3 years (2014-2016) and SARIMA.

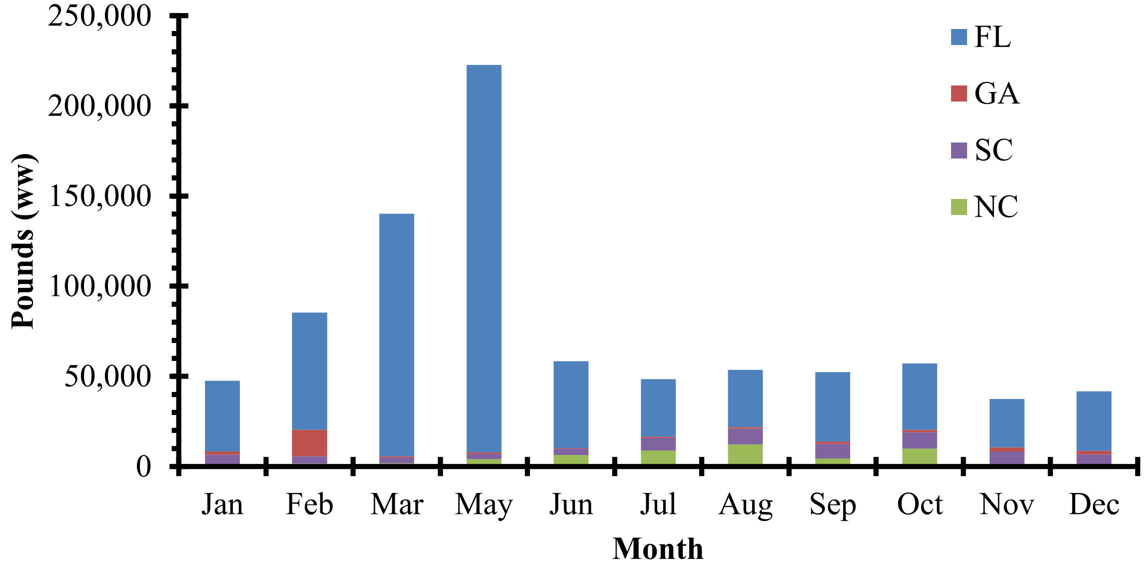


Figure 9. The average monthly South Atlantic greater amberjack landings by state from 2005-2015 in pounds whole weight. Data from the month of April was not available due to the seasonal closure in place since 1999. The year 2016 was excluded due to a closure. Source: Southeast Fisheries Science Center commercial (10/5/2017) ACL dataset.

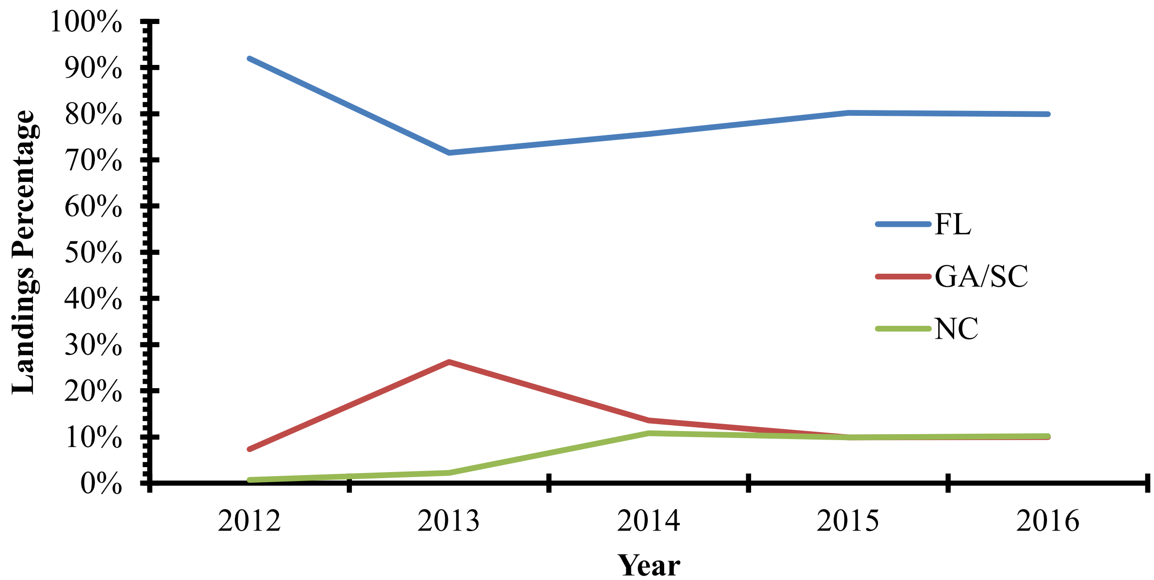


Figure 10. The percentage of annual South Atlantic greater amberjack landings by state from 2012-2016. Georgia and South Carolina were combined due to confidentiality concerns. North Carolina's seafood dealers began using a species-specific code for greater amberjack in 2011, but it was not until 2015 that unclassified amberjacks was completely removed as an option. Source: Southeast Fisheries Science Center commercial (10/5/2017) ACL dataset.

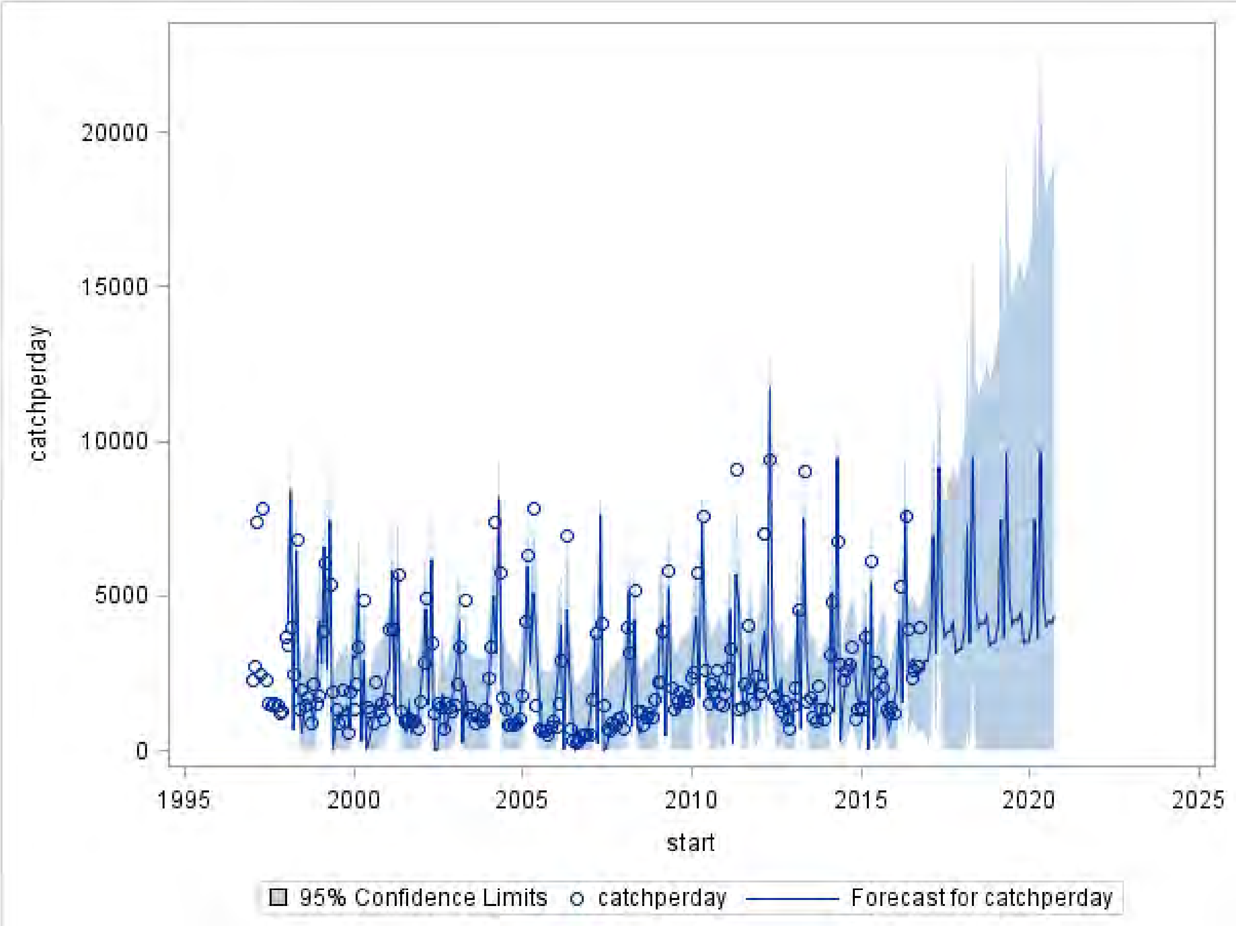


Figure 11. Final SARIMA model fit for greater amberjack monthly commercial landings (lb ww) per open day.

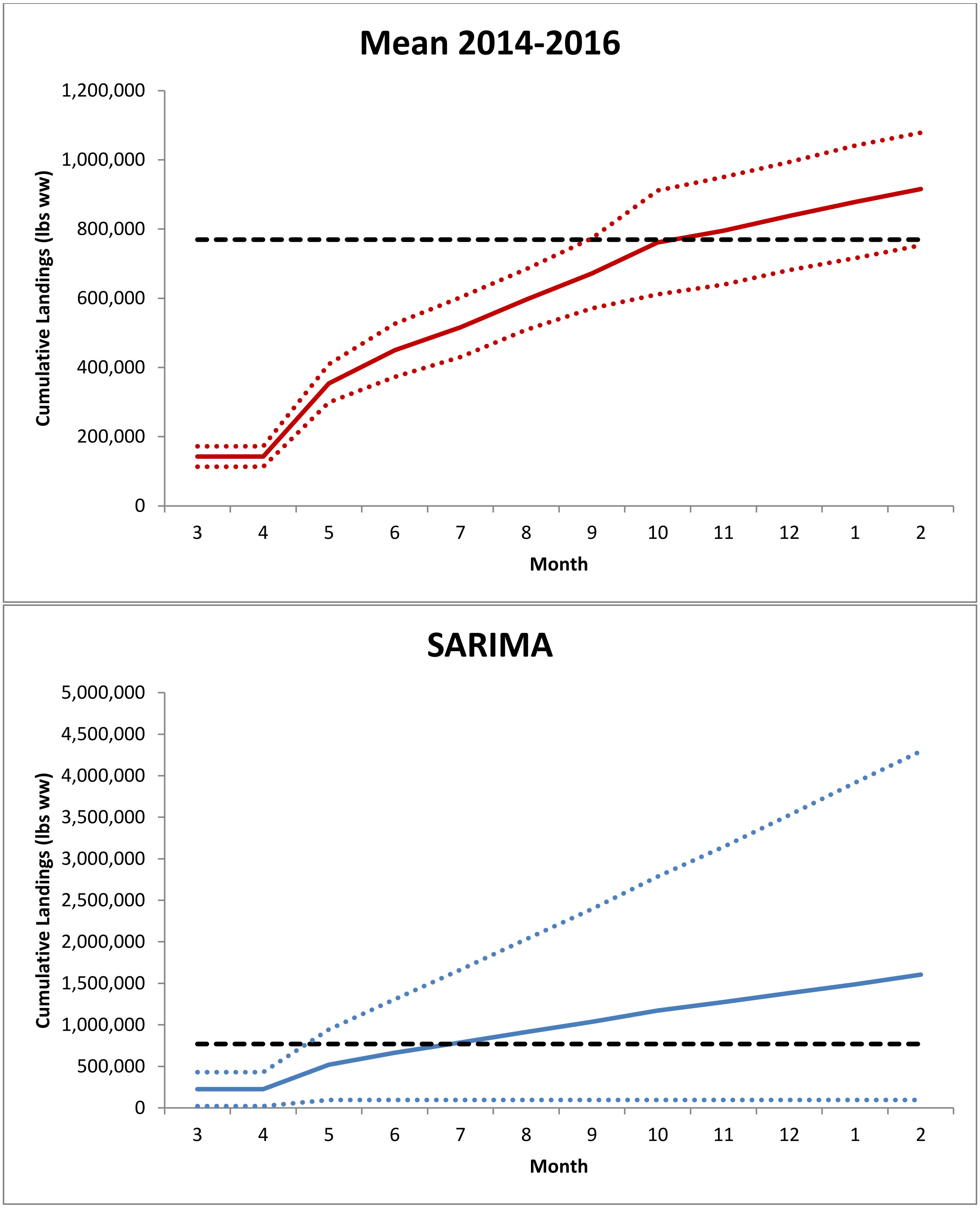


Figure 12. Mean (solid line) and 95% confidence limits (dotted lines) for Greater amberjack projected cumulative landings relative to ACL under two projection models: Mean of last 3 years (2014-2016) and SARIMA.

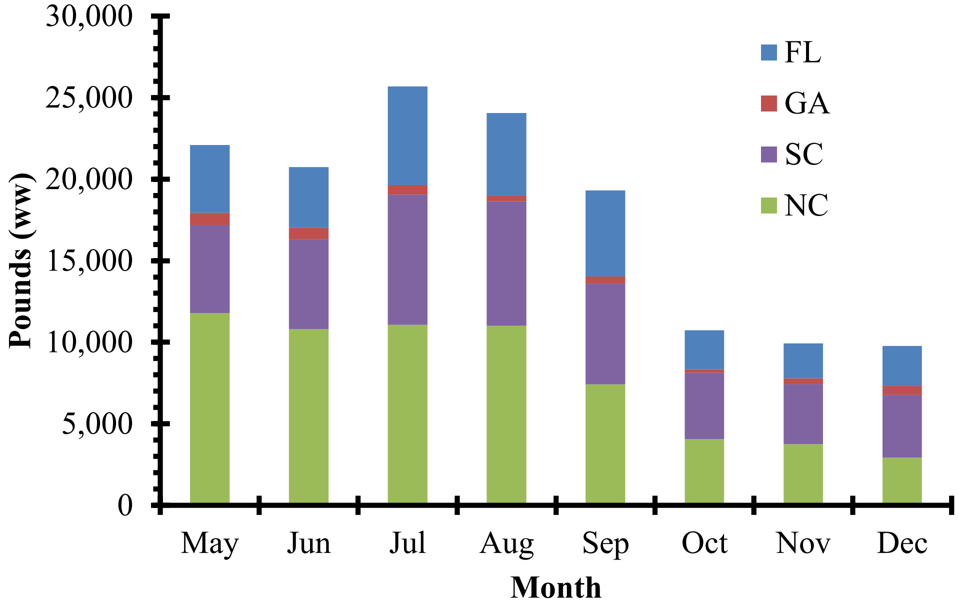


Figure 13. The average monthly South Atlantic red porgy landings by state from 2005-2012 and 2014-2016 in pounds whole weight. The year 2013 was excluded due to a closure. Data from the months of January to April was not available due to the seasonal closure in place since 2000. Source: Southeast Fisheries Science Center commercial (5/2/2017) ACL dataset.

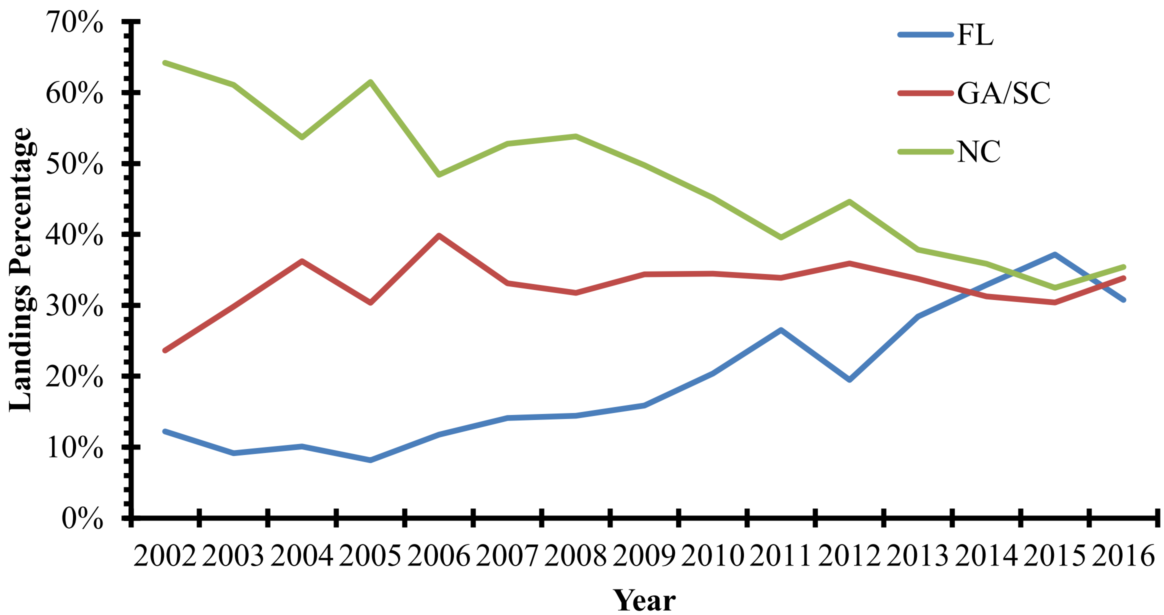


Figure 14. The percentage of annual South Atlantic red porgy landings by state from 2002-2016. Georgia and South Carolina were combined due to confidentiality concerns. Source: Southeast Fisheries Science Center commercial (5/2/2017) ACL dataset.

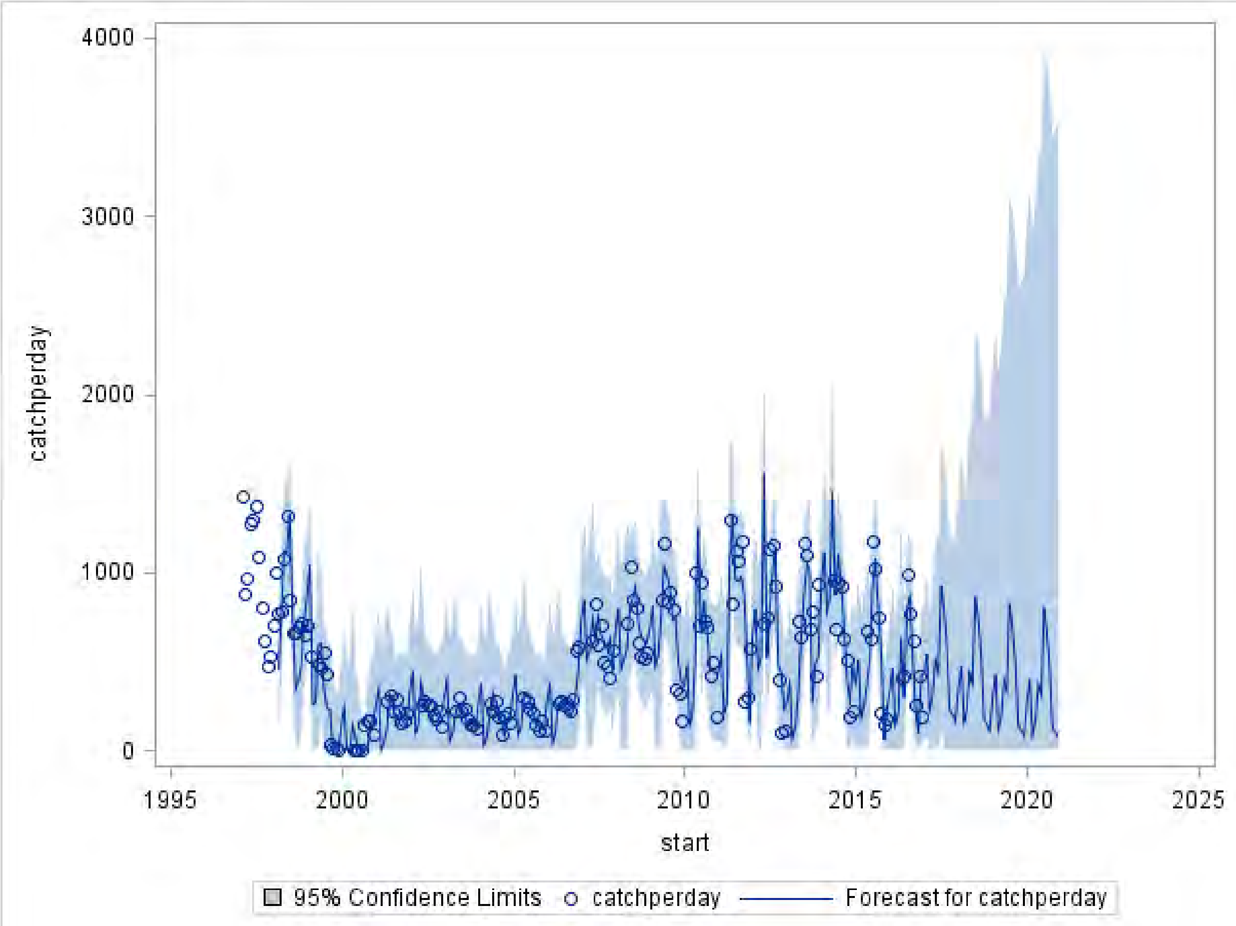


Figure 15. Final SARIMA model fit for red porgy monthly commercial landings (lb ww) per open day.

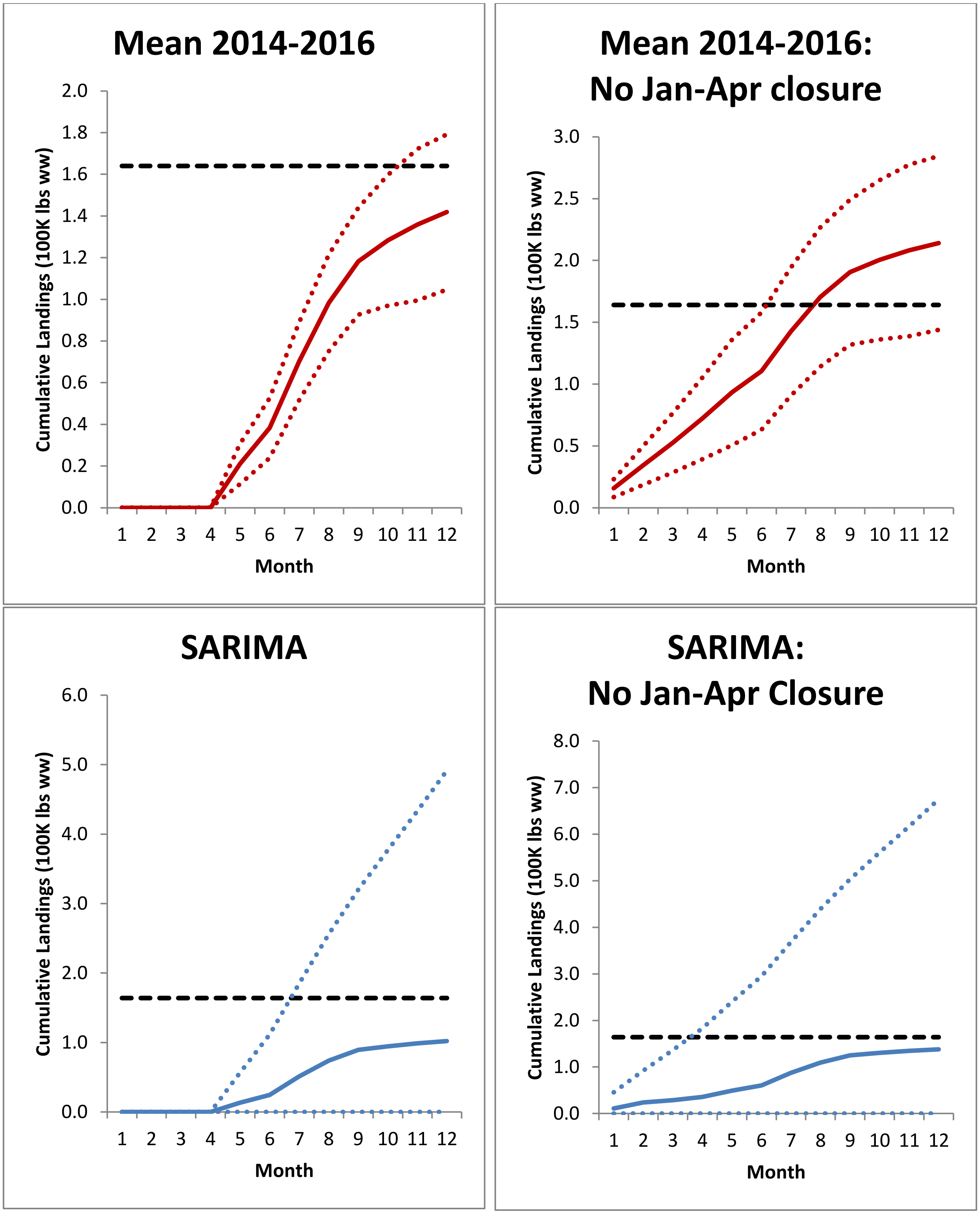


Figure 16. Mean (solid line) and 95% confidence limits (dotted lines) for Red porgy projected cumulative landings relative to ACL, with and without Jan-Apr closure, for two projection models: Mean of last 3 years (2014-2016) and SARIMA.

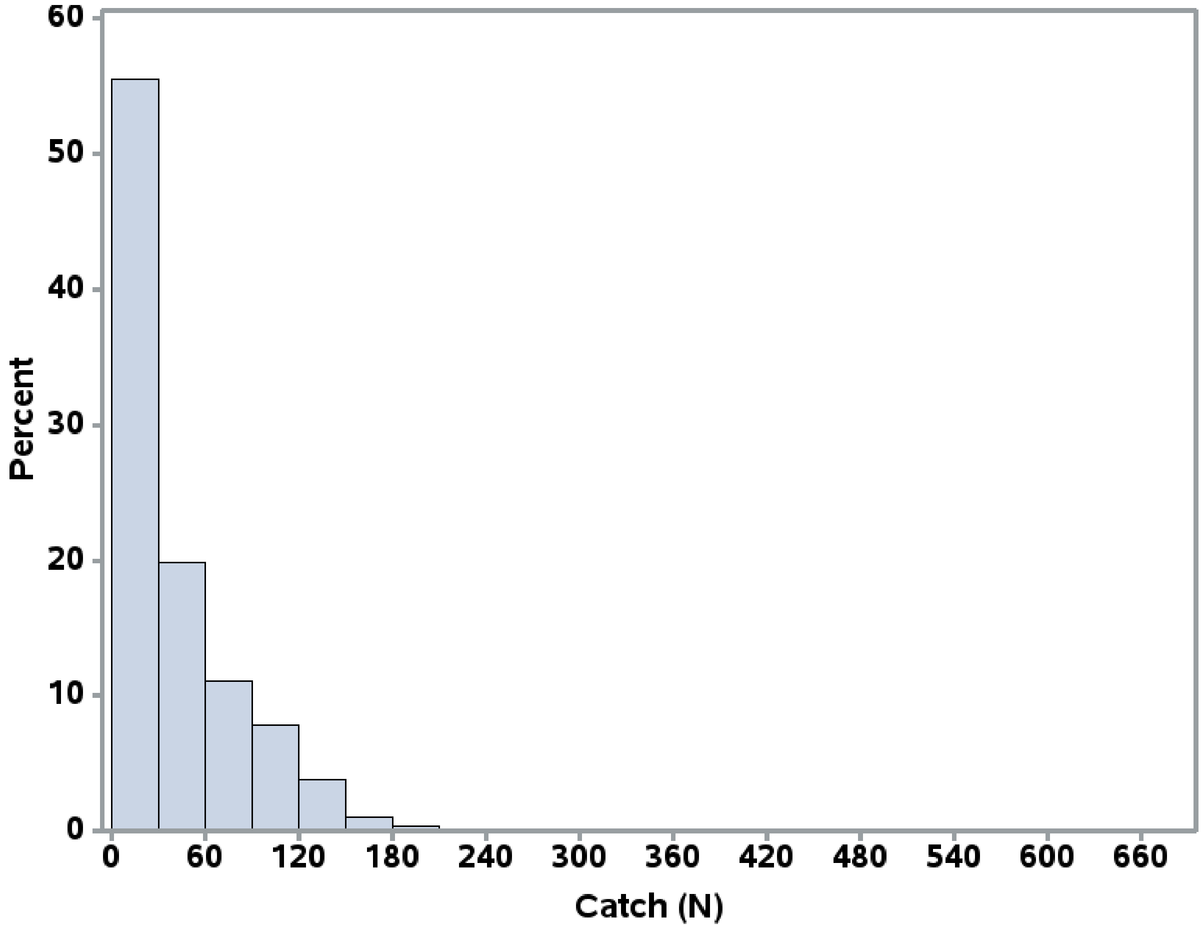


Figure 17. Histogram of estimated number of red porgy caught per trip based on Commercial Logbook reported landings in pounds whole weight divided by mean weights for red porgy intercepted by the Trip Interview Program, by state and year, 2006-2016.

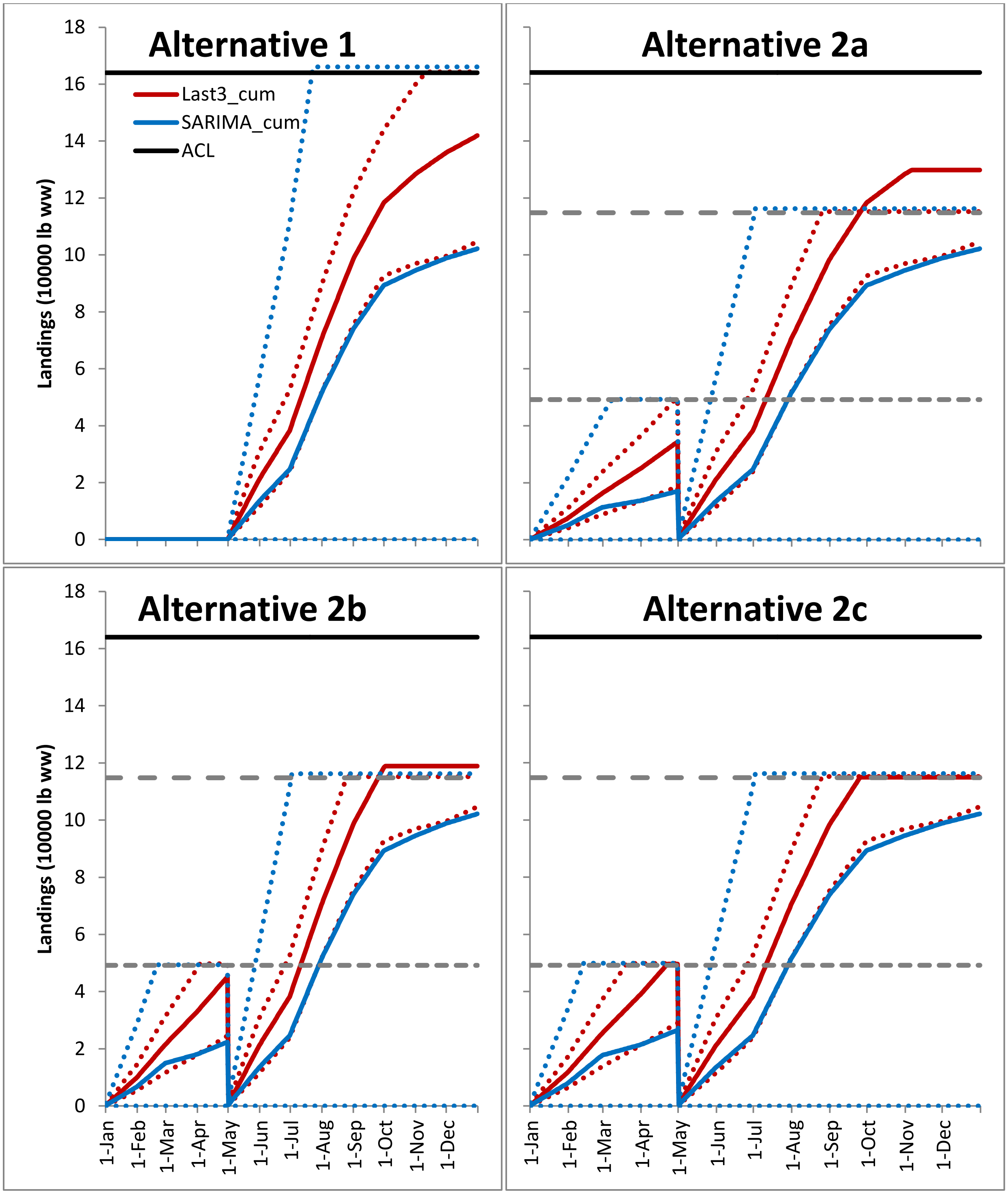


Figure 18. Mean (solid line) and 95% confidence limits (dotted lines) for red porgy projected cumulative landings relative to ACL under two projection models: Mean of last 3 years (2014-2016; red) and SARIMA (blue) relative to ACL (black) and seasonal quotas of 30%, 50%, and 70% of the ACL (gray).

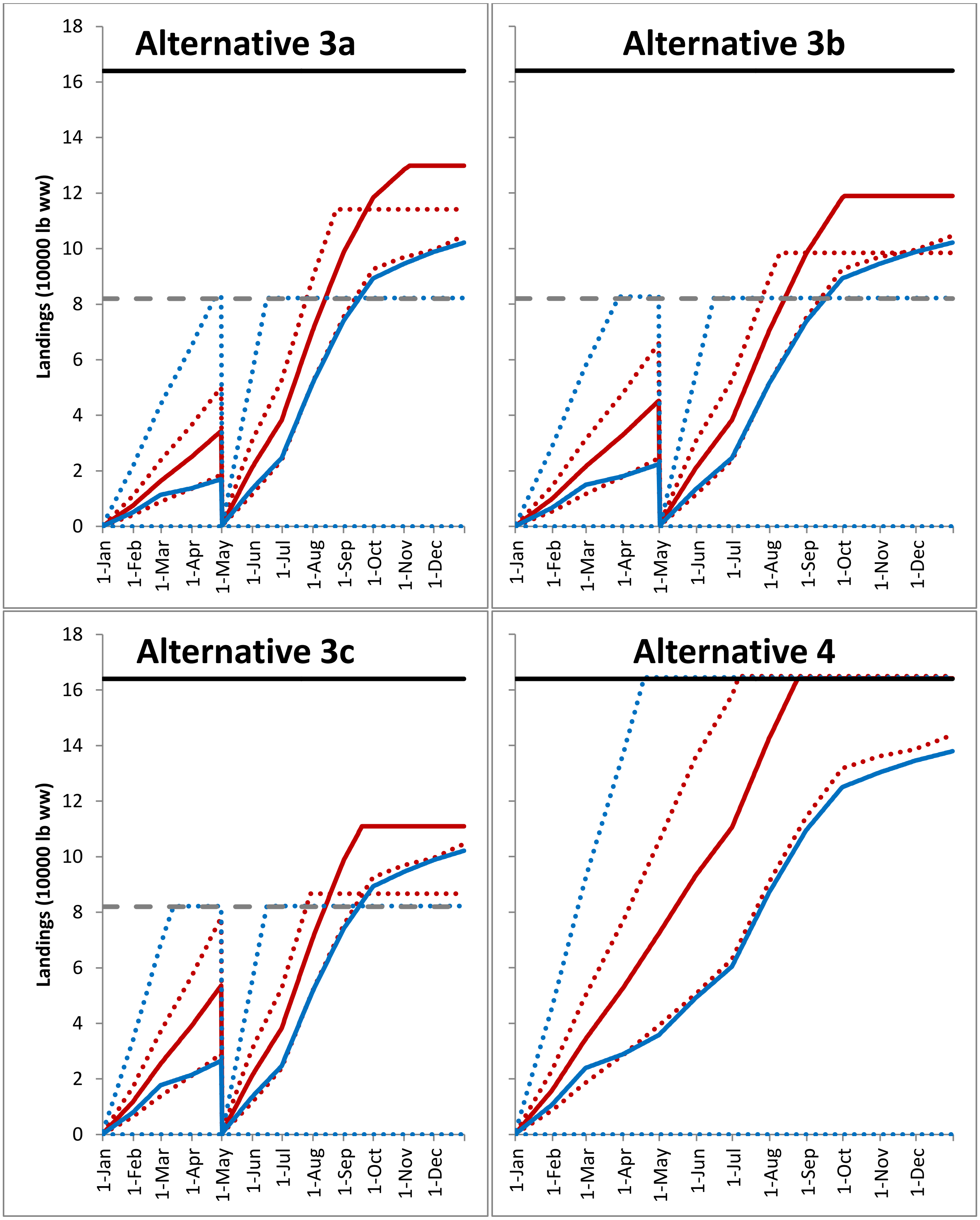


Figure 18 (con't)

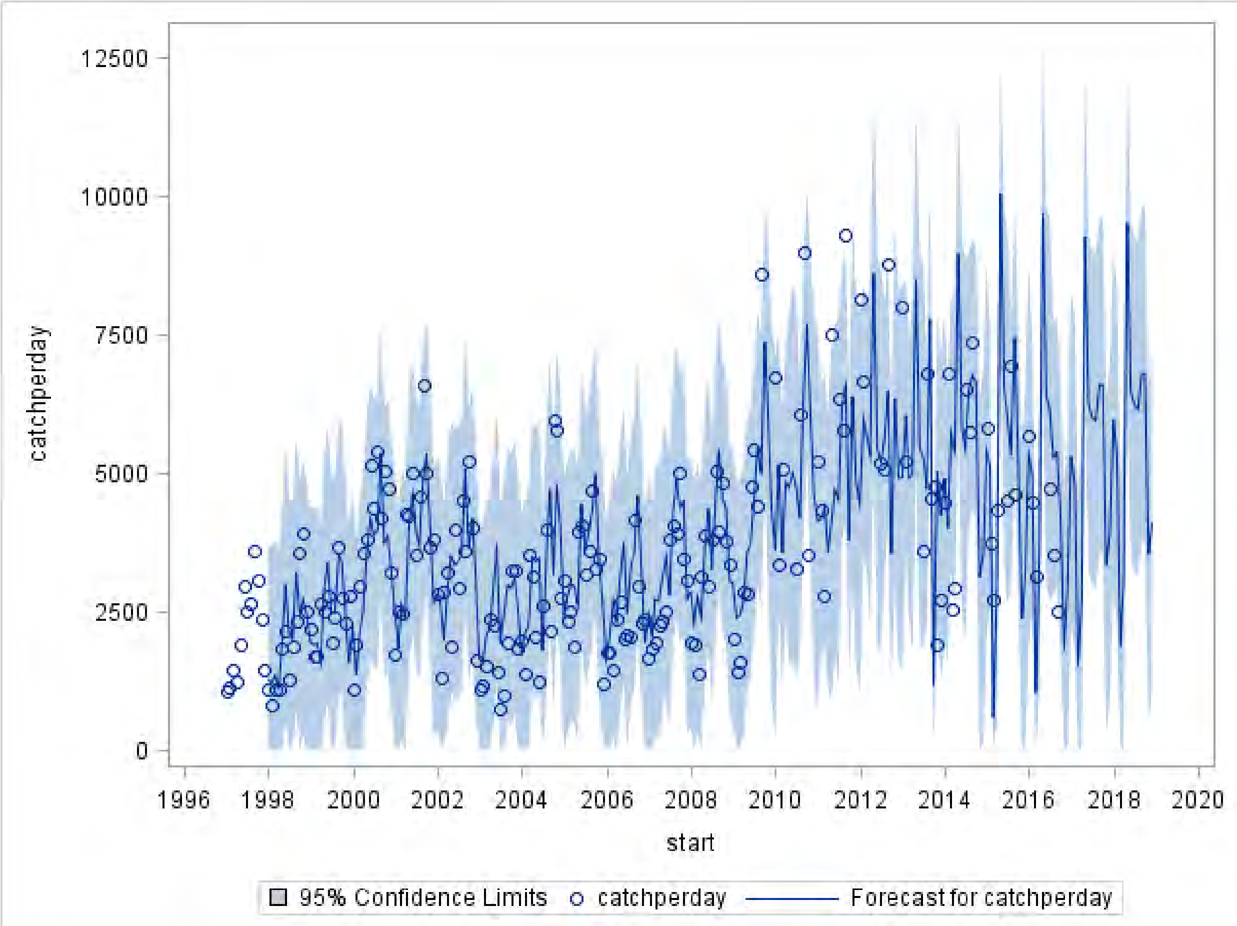


Figure 19. Final SARIMA model fit for vermilion snapper monthly commercial landings (lb ww) per open day.

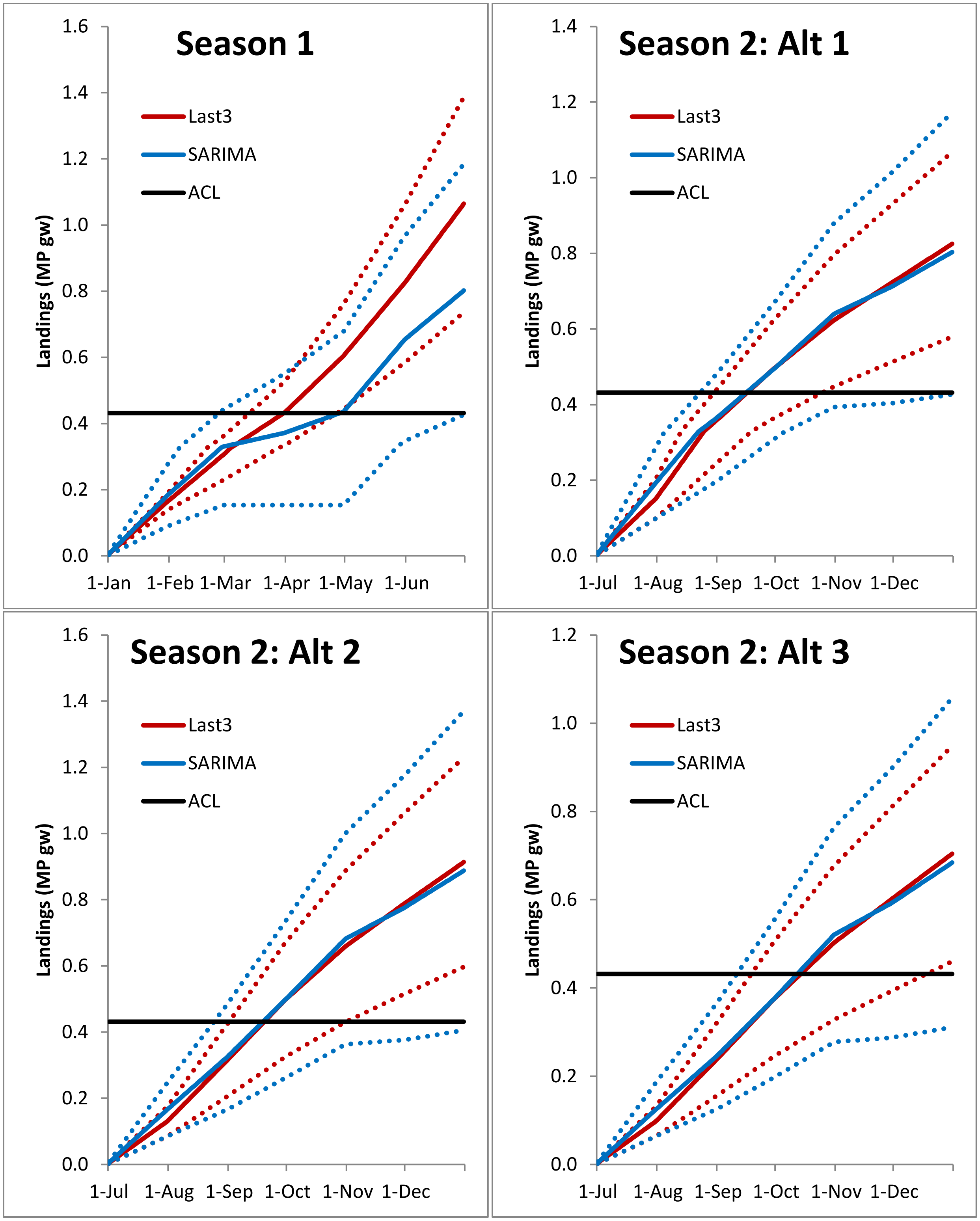


Figure 20. Mean (solid line) and 95% confidence limits (dotted lines) for vermilion snapper projected cumulative landings relative to ACL under two projection models: Mean of last 3 years (2014-2016) and SARIMA.

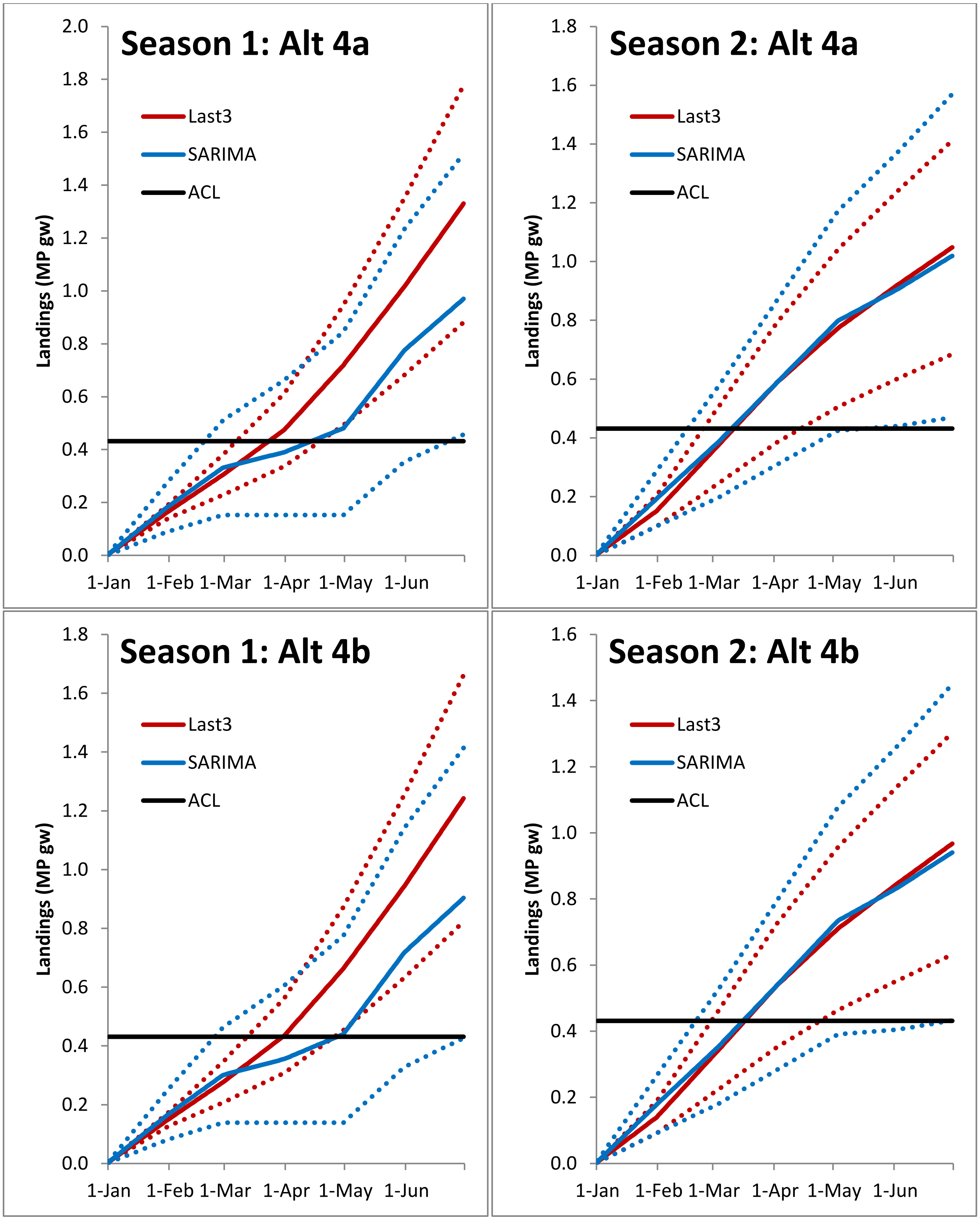


Figure 20 (con't).

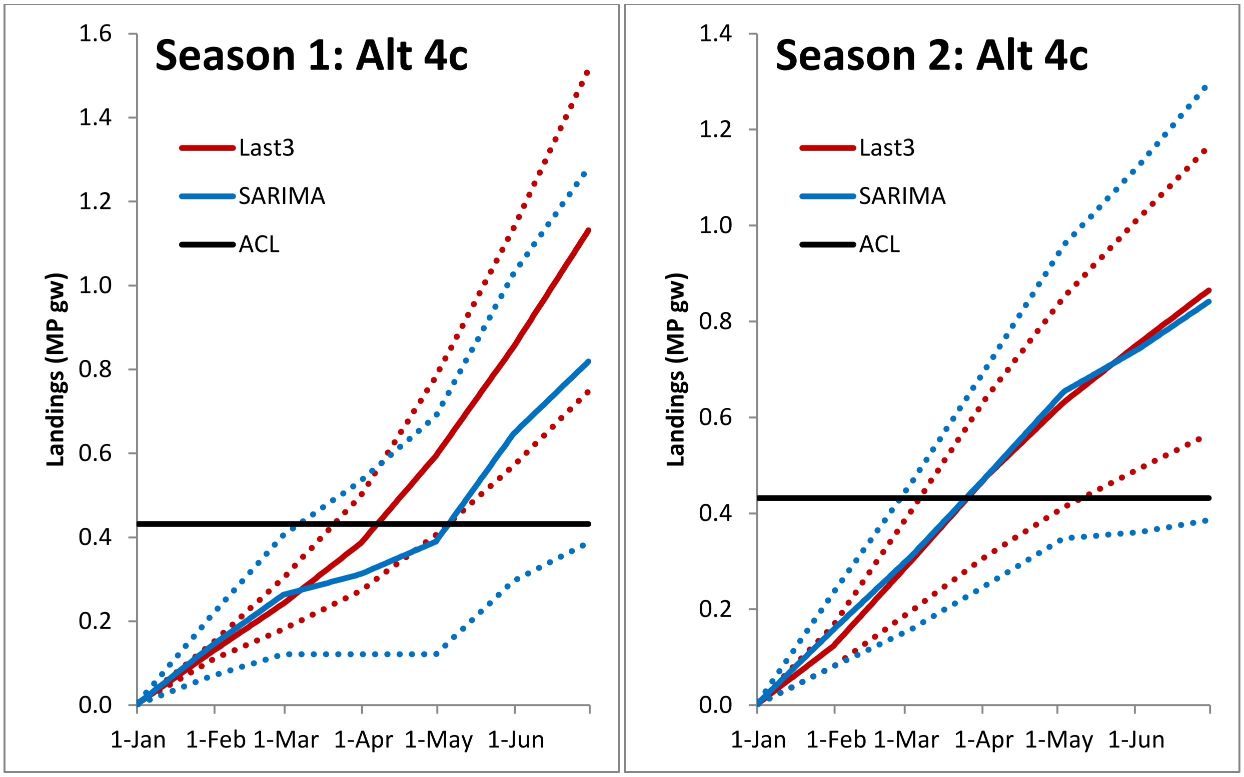


Figure 20 (con't).

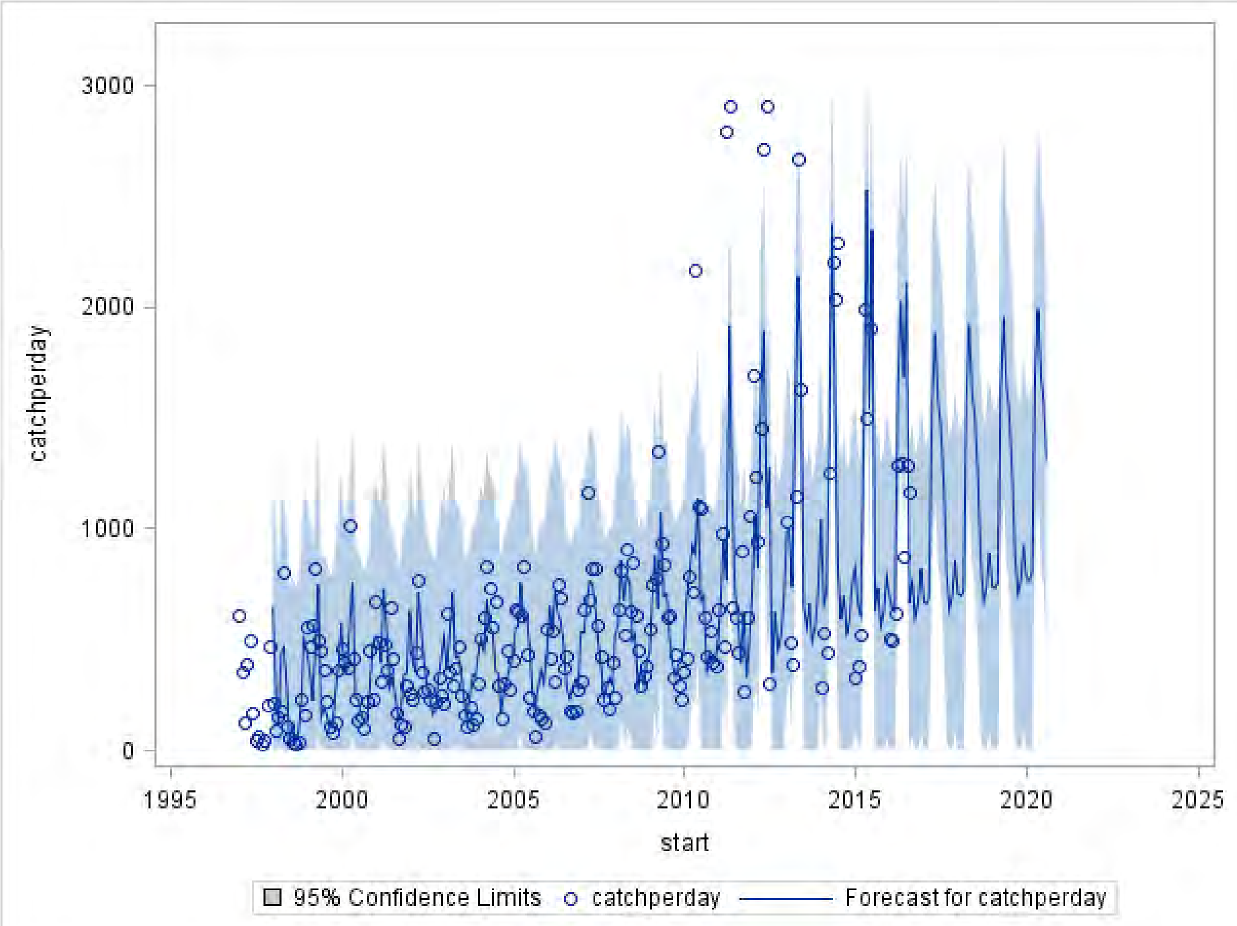


Figure 21. Final SARIMA model fit for Jacks complex monthly commercial landings (lb ww) per open day.

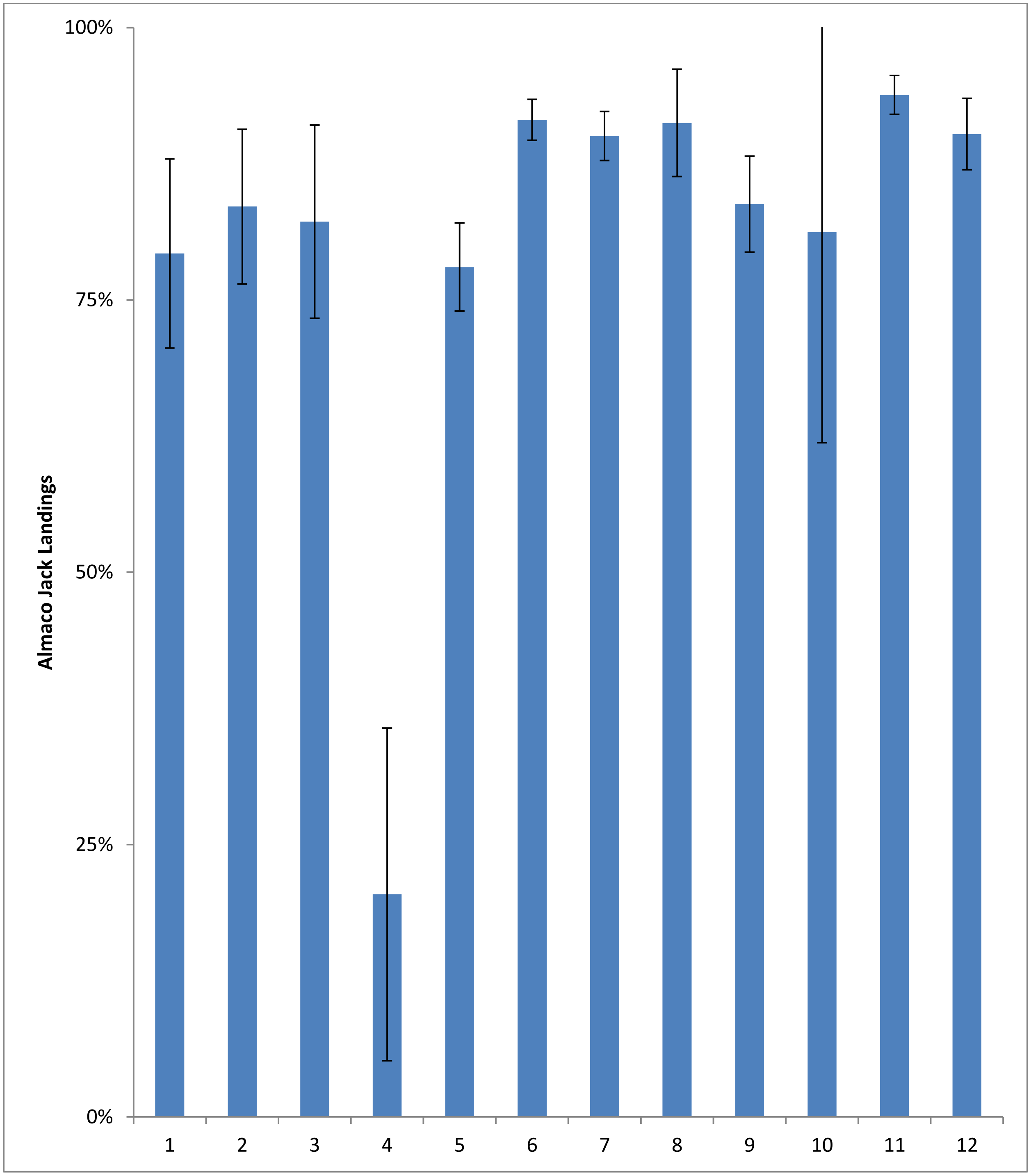


Figure 22. Monthly ratio of almaco jack to Jacks complex commercial landings from the most recent three completely open fishing years. Error bars denote standard deviation.

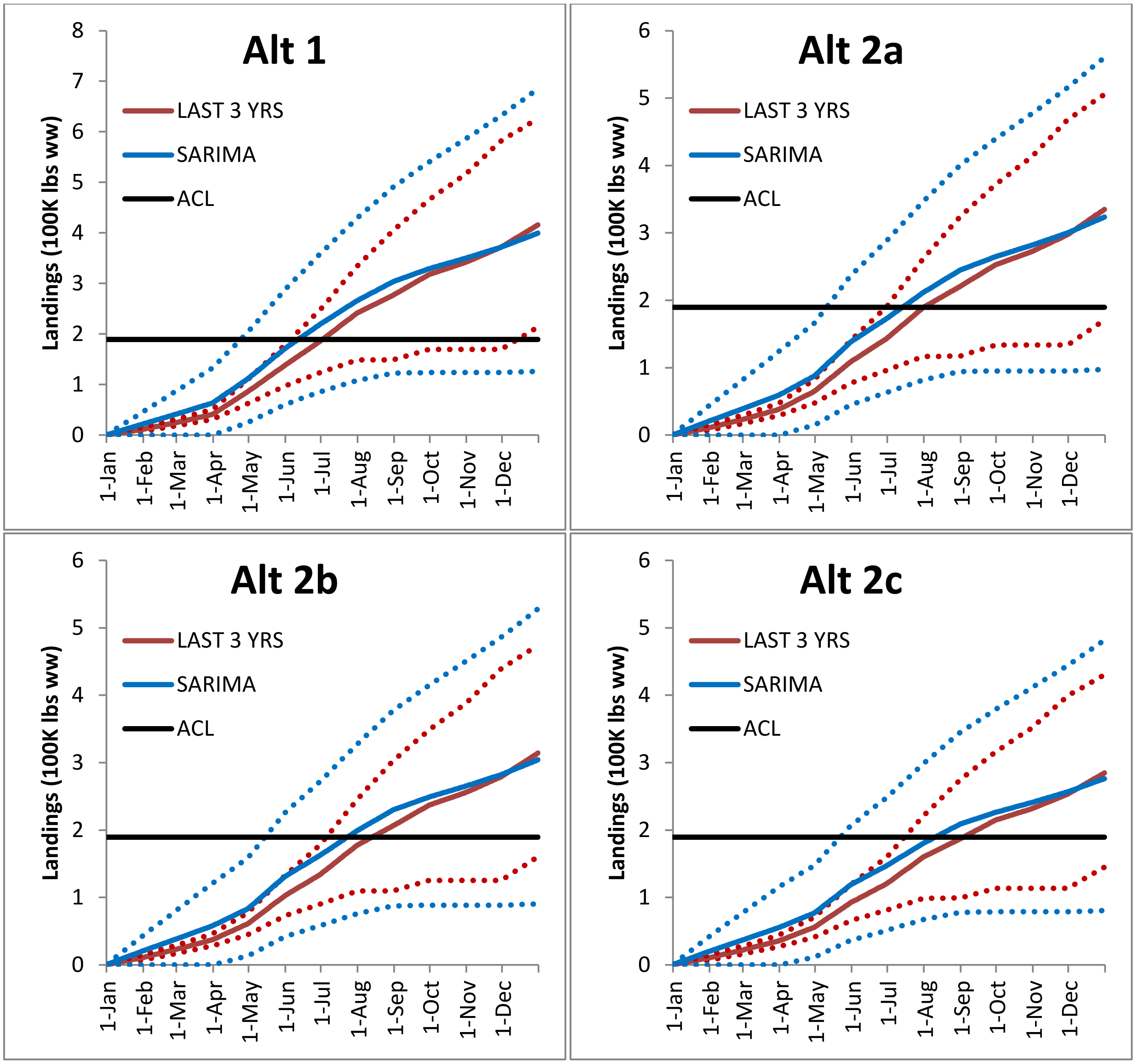


Figure 23. Mean (solid line) and 95% confidence limits (dotted lines) for Jacks complex projected cumulative landings relative to ACL under two projection models: Mean of last 3 years (2014-2016) and SARIMA.

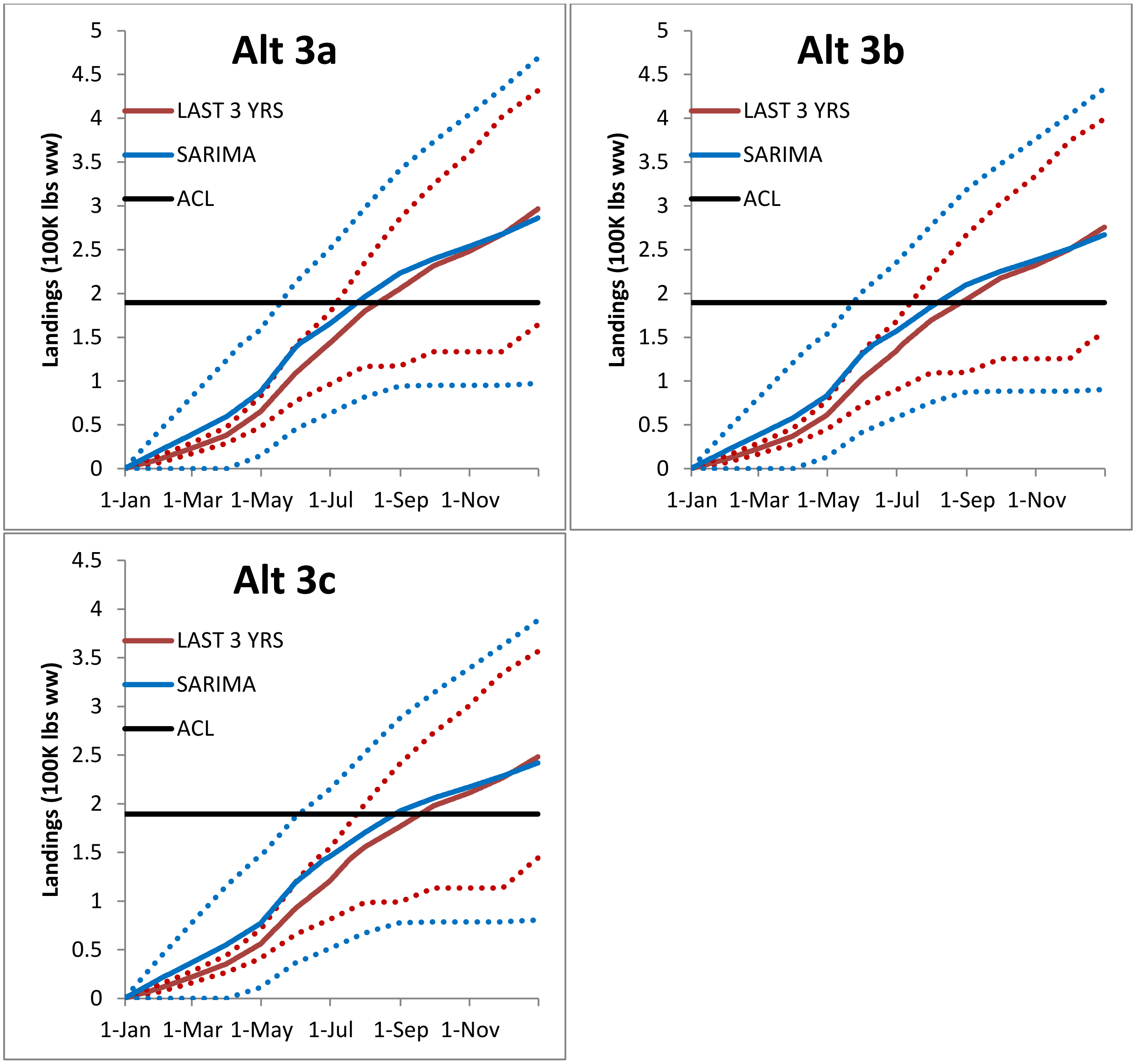


Figure 23 (con't). Mean (solid line) and 95% confidence limits (dotted lines) for Jacks complex projected cumulative landings relative to ACL under two projection models: Mean of last 3 years (2014-2016) and SARIMA.

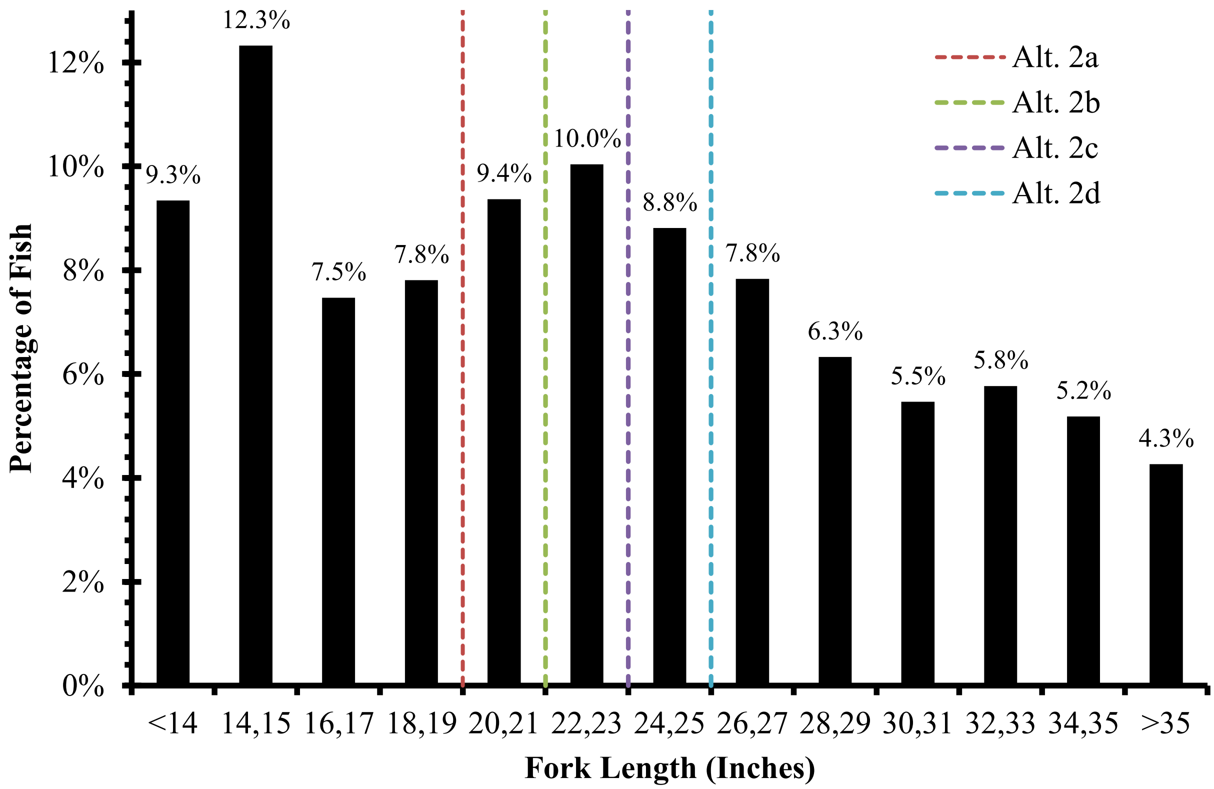


Figure 24. The length distribution of almaco jacks harvested in the South Atlantic from commercial TIP (n=3,587) data from 2014 – 2016. The dashed lines denote the commercial minimum size limit proposed in each alternative.

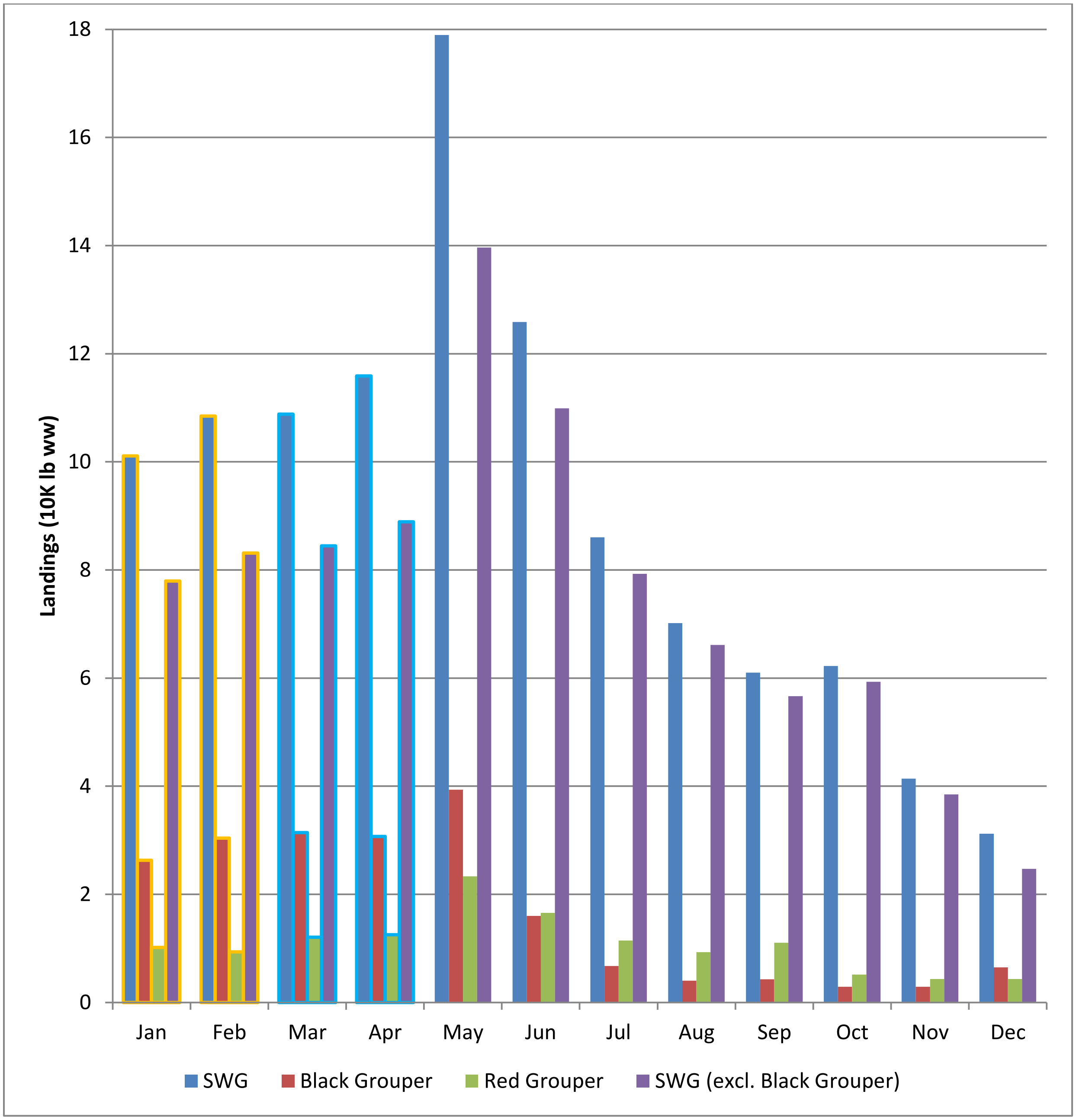


Figure 25. Mean 2014-2016 (no outline) and projected (outlines) monthly commercial landings for shallow water grouper (SWG: gag, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, graysby, and coney), black grouper, red grouper, and SWG excluding black grouper. Orange outlines denote expansions using mean ratio of Jan-Feb to May 2007-2009 landings; blue outlines denote expansions using mean ratio of Mar-Apr to May 1996-1998 landings.

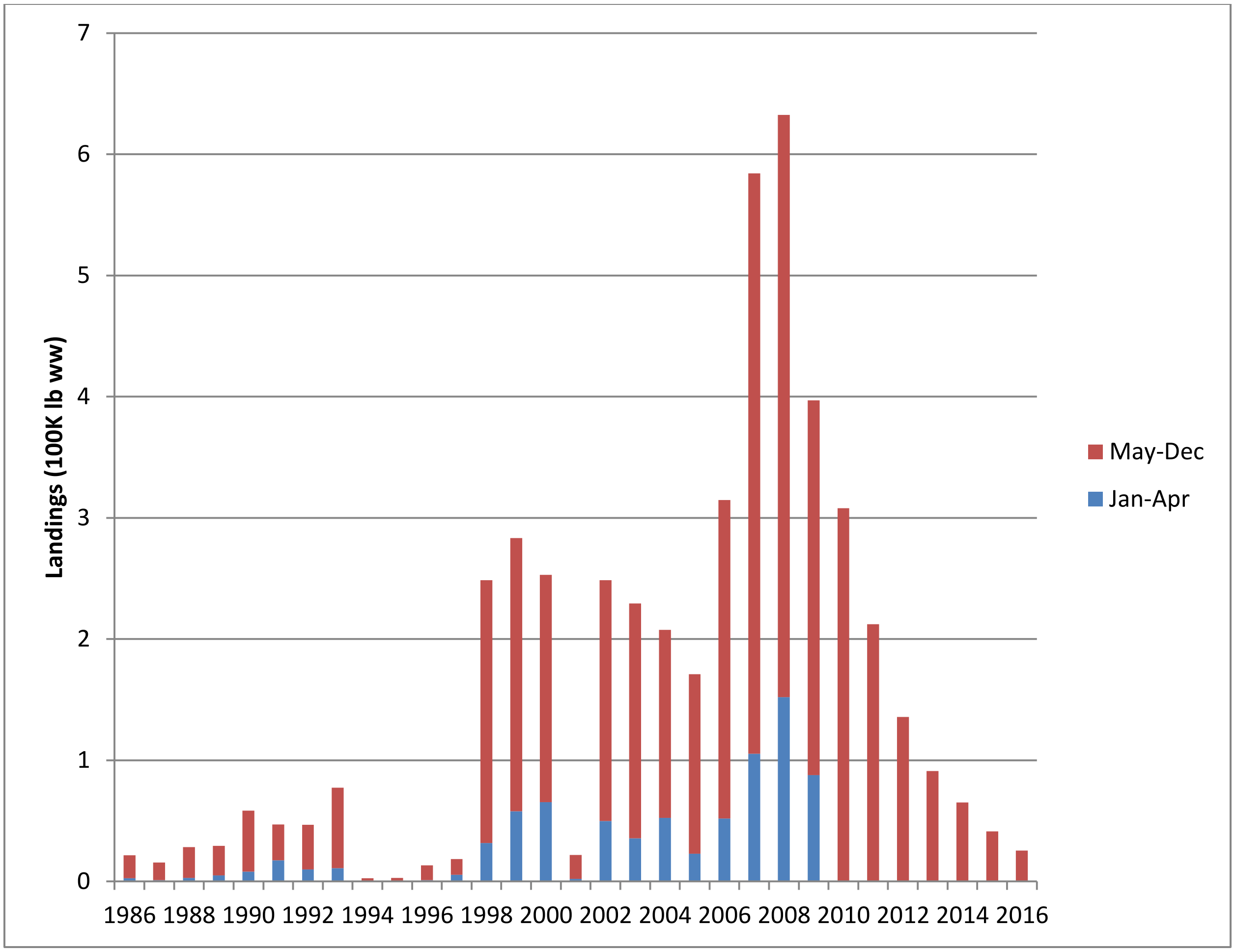


Figure 26. Commercial landings (100,000 pounds whole weight) of red grouper reported by dealers from South and North Carolina, before and after the January-April shallow-water grouper closure implementation in mid-2009.

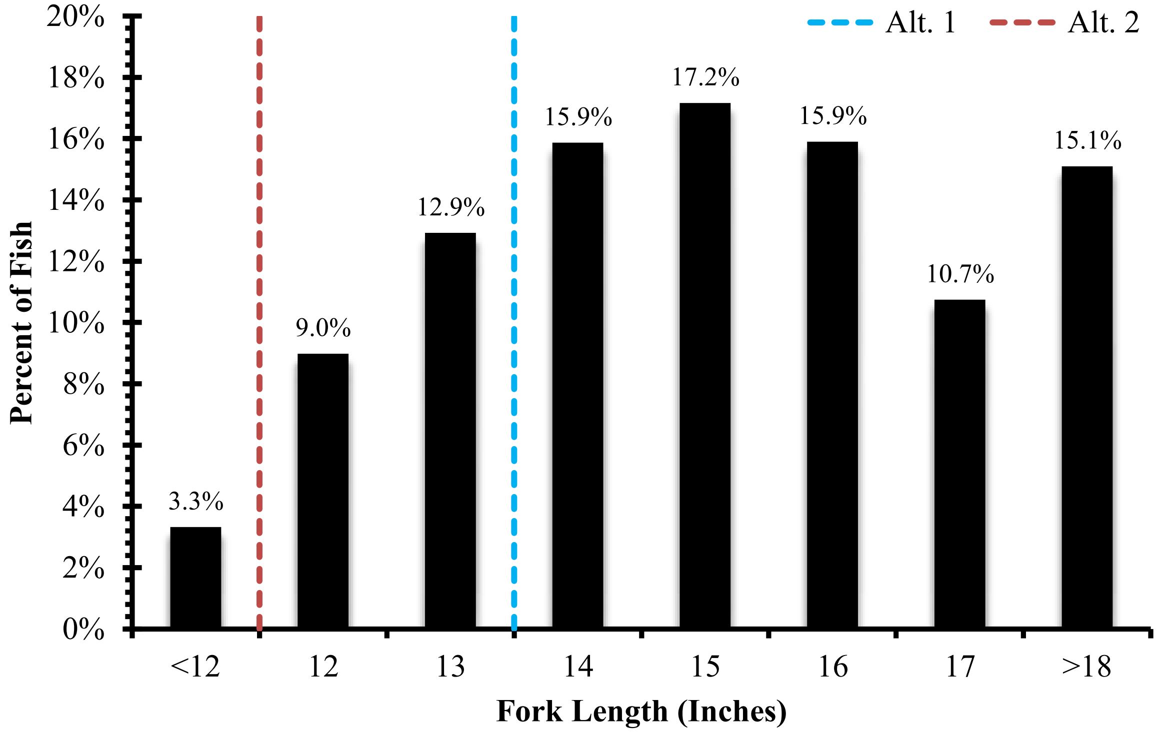


Figure 27. The length distribution of gray triggerfish captured in federal waters off east Florida generated from commercial TIP (n=2,616) data from January 2014 to June 2015. The dashed lines denote the commercial minimum size limit proposed in each alternative.

SUPPLEMENTAL TABLES AND FIGURES

Table S-1. Seasonal (*s*) autoregressive integrated moving average (SARIMA) (*p*,*d*,*q*)x(*P*,*D*,*Q*)s model combinations evaluated, where the autoregressive component (*p*) represents the lingering effects of previous observations, the integrated component (*d*) represents temporal trends, the moving average component (*q*) represents lingering effects of previous random shocks (or error), and s denotes the seasonal time step. As recreational landings are primarily collected in 2-month waves, *s* was set to 6. A "1" denotes an active component in the model.

ARIMA(*p,d,q*)X(*P,D,Q*)s Model
ARIMA(0,1,1)X(0,1,1)*s*
ARIMA(1,0,0)X(0,1,1)*s*
ARIMA(0,0,1)X(0,1,1)*s*
ARIMA(0,1,1)X(1,1,0)*s*
ARIMA(1,0,0)X(1,1,0)*s*
ARIMA(0,0,1)X(1,1,0)*s*
ARIMA(1,1,0)X(0,1,1)*s*
ARIMA(1,1,0)X(1,1,0)*s*

Table S-2. Mean monthly estimates of discards (numbers of fish) from all South Atlantic commercial trips (2014-2016) based on self-reported discard rates (SEFSC Supplemental Discard Logbook, accessed May 2017) expanded to overall South Atlantic commercial fishing effort (SEFSC Commercial Logbook, accessed May 2017), aggregated across all gears. Note that SEDAR has found this approach consistently underestimates discarded fish relative to observer data in the Gulf of Mexico, and the 95% confidence limits for many of these expanded estimates overlap zero, indicating substantial uncertainty in the data (see **Figures S1-9**).

Month	Blueline Tilefish	Red Porgy	Snowy Grouper	Greater Amberjack	Vermilion Snapper	Jacks	SWG	DWS	Gray Triggerfish
1	3.36	4301.28	21.79	252.35	1473.76	51.45	477.41	0.00	473.48
2	5.46	4400.48	9.69	201.91	1555.67	47.70	492.18	0.00	509.79
3	12.17	5008.66	31.40	194.86	1802.61	69.51	699.54	3.90	272.92
4	1564.03	2868.43	37.91	146.88	1129.58	15.29	479.09	0.00	134.62
5	811.20	2068.36	63.34	524.34	5131.96	65.40	1711.23	0.00	4242.74
6	313.83	1054.46	103.30	578.14	3532.59	132.38	696.81	0.00	2145.66
7	115.53	1428.28	106.24	338.61	2435.49	596.83	1236.36	0.00	2730.68
8	899.71	1498.00	19.76	369.51	2394.22	1183.32	1748.28	0.00	1985.43
9	1260.22	924.08	13.41	312.48	1972.90	751.37	1554.68	0.00	2419.15
10	14.98	251.32	1.70	368.43	2529.10	738.61	1392.88	0.00	1799.98
11	3.15	70.92	23.75	94.12	2123.60	149.76	1370.58	0.00	812.42
12	0.00	112.81	1.57	72.31	1838.30	247.58	656.46	0.00	609.86

SWG: Shallow-water grouper (gag, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, graysby, and coney), DWS: Deep-water snapper (blackfin, queen, silk snapper), Jacks: lesser amberjack, almaco jack, banded rudderfish.

Table S-3. The average monthly South Atlantic blueline tilefish landings by state from 2004-2013 in pounds whole weight. The years 2014-2016 were excluded due to closures.

Month	FL	GA	NC	SC
Jan	1,535	0	6,171	1,551
Feb	952	2	4,651	1,428
Mar	1,879	4	3,776	2,921
Apr	1,500	5	11,815	4,080
May	1,125	34	27,503	1,636
Jun	1,255	25	25,878	1,264
Jul	721	11	44,735	1,046
Aug	637	10	53,516	365
Sep	481	0	19,697	264
Oct	308	2	13,983	387
Nov	453	1	10,171	650
Dec	265	2	4,389	428

Source: Southeast Fisheries Science Center commercial (5/2/2017) ACL dataset.

Table S-4. The percentage of annual South Atlantic blueline tilefish landings by state from 2002-2016. Georgia and South Carolina were combined due to confidentiality concerns.

Year	FL	GA/SC	NC
2002	11.3%	6.5%	82.1%
2003	22.2%	9.3%	68.4%
2004	23.0%	30.4%	46.6%
2005	29.7%	24.0%	46.0%
2006	8.9%	15.5%	75.6%
2007	14.8%	6.1%	79.1%
2008	2.6%	1.7%	95.5%
2009	1.7%	1.0%	97.3%
2010	0.9%	3.4%	95.6%
2011	1.1%	3.1%	95.6%
2012	1.3%	1.2%	97.5%
2013	4.3%	17.9%	77.4%
2014	11.8%	42.2%	45.9%
2015	14.3%	51.0%	34.7%
2016	15.3%	7.5%	77.2%

Source: Southeast Fisheries Science Center commercial (5/2/2017) ACL dataset.

Table S-5. The average monthly South Atlantic snowy grouper landings by state from 2002-2005 and 2007-2011 in pounds whole weight. The years 2006 and 2012-2016 were excluded due to closures.

Month	FL	GA	NC	SC
Jan	5,879	63	1,755	1,367
Feb	5,664	17	3,167	1,551
Mar	5,434	300	4,437	2,892
Apr	8,056	419	10,583	5,684
May	6,917	330	13,307	4,660
Jun	8,519	171	8,409	3,836
Jul	5,701	498	6,830	2,196
Aug	5,149	168	6,486	1,693
Sep	5,198	50	3,135	1,284
Oct	6,429	33	1,842	1,716
Nov	4,022	43	773	2,537
Dec	3,417	56	543	1,809

Source: Southeast Fisheries Science Center commercial (5/2/2017) ACL dataset.

Table S-6. The percentage of annual South Atlantic snowy grouper landings by state from 2002-2016. Georgia and South Carolina were combined due to confidentiality concerns.

Year	FL	GA/SC	NC
2002	44.4%	17.0%	38.6%
2003	41.7%	14.6%	43.7%
2004	36.9%	25.8%	37.4%
2005	33.9%	30.8%	35.3%
2006	27.4%	32.0%	40.6%
2007	52.5%	11.0%	36.5%
2008	53.5%	15.3%	31.0%
2009	49.9%	13.2%	36.9%
2010	48.3%	17.0%	34.7%
2011	39.9%	39.7%	20.4%
2012	54.4%	21.1%	24.5%
2013	58.1%	20.3%	21.6%
2014	55.6%	19.7%	24.7%
2015	52.0%	17.5%	30.5%
2016	38.1%	22.6%	39.3%

Source: Southeast Fisheries Science Center commercial (5/2/2017) ACL dataset.

Table S-7. The average monthly South Atlantic greater amberjack landings by state from 2005-2015 in pounds whole weight. Data from the month of April was not available due to the seasonal closure in place since 1999. The year 2016 was excluded due to a closure.

Month	FL	GA	SC	NC
Jan	39,199	1,790	5,238	1,273
Feb	64,819	14,725	4,116	1,617
Mar	134,461	618	3,257	1,766
May	214,751	882	2,827	4,170
Jun	48,072	389	3,581	6,322
Jul	31,943	654	6,886	8,956
Aug	31,834	943	8,569	12,326
Sep	38,475	1,388	8,120	4,428
Oct	36,763	1,340	9,051	10,002
Nov	26,862	2,199	6,950	1,478
Dec	33,049	1,905	5,870	868

Source: Southeast Fisheries Science Center commercial (10/5/2017) ACL dataset.

Table S-8. The percentage of annual South Atlantic greater amberjack landings by state from 2012-2016. Georgia and South Carolina were combined due to confidentiality concerns. North Carolina's seafood dealers began using a species-specific code for greater amberjack in 2011, but it was not until 2015 that unclassified amberjacks was completely removed as an option.

Year	FL	GA/SC	NC
2012	92.0%	7.3%	0.7%
2013	71.5%	26.2%	2.2%
2014	75.6%	13.6%	10.8%
2015	80.2%	9.9%	9.9%
2016	79.9%	10.0%	10.1%

Source: Southeast Fisheries Science Center commercial (10/5/2017) ACL dataset.

Table S-9. The average monthly South Atlantic red porgy landings by state from 2005-2012 and 2014-2016 in pounds whole weight. The year 2013 was excluded due to a closure. Data from the months of January to April was not available due to the seasonal closure in place since 2000.

Month	FL	GA	SC	NC
May	4,158	731	5,410	11,785

Jun	3,733	677	5,515	10,816
Jul	6,040	596	7,987	11,064
Aug	5,077	337	7,635	11,013
Sep	5,290	426	6,183	7,416
Oct	2,395	211	4,056	4,071
Nov	2,138	364	3,693	3,742
Dec	2,452	545	3,841	2,931

Source: Southeast Fisheries Science Center commercial (5/2/2017) ACL dataset.

Table S-10. The percentage of annual South Atlantic red porgy landings by state from 2002-2016. Georgia and South Carolina were combined due to confidentiality concerns.

Year	FL	GA/SC	NC
2002	12.2%	23.6%	64.2%
2003	9.1%	29.8%	61.1%
2004	10.1%	36.2%	53.7%
2005	8.1%	30.3%	61.5%
2006	11.8%	39.8%	48.4%
2007	14.1%	33.1%	52.8%
2008	14.4%	31.7%	53.8%
2009	15.9%	34.3%	49.8%
2010	20.4%	34.4%	45.2%
2011	26.5%	33.9%	39.6%
2012	19.5%	35.9%	44.6%
2013	28.4%	33.7%	37.9%
2014	32.9%	31.3%	35.8%
2015	37.1%	30.4%	32.5%
2016	30.8%	33.8%	35.4%

Source: Southeast Fisheries Science Center commercial (5/2/2017) ACL dataset.

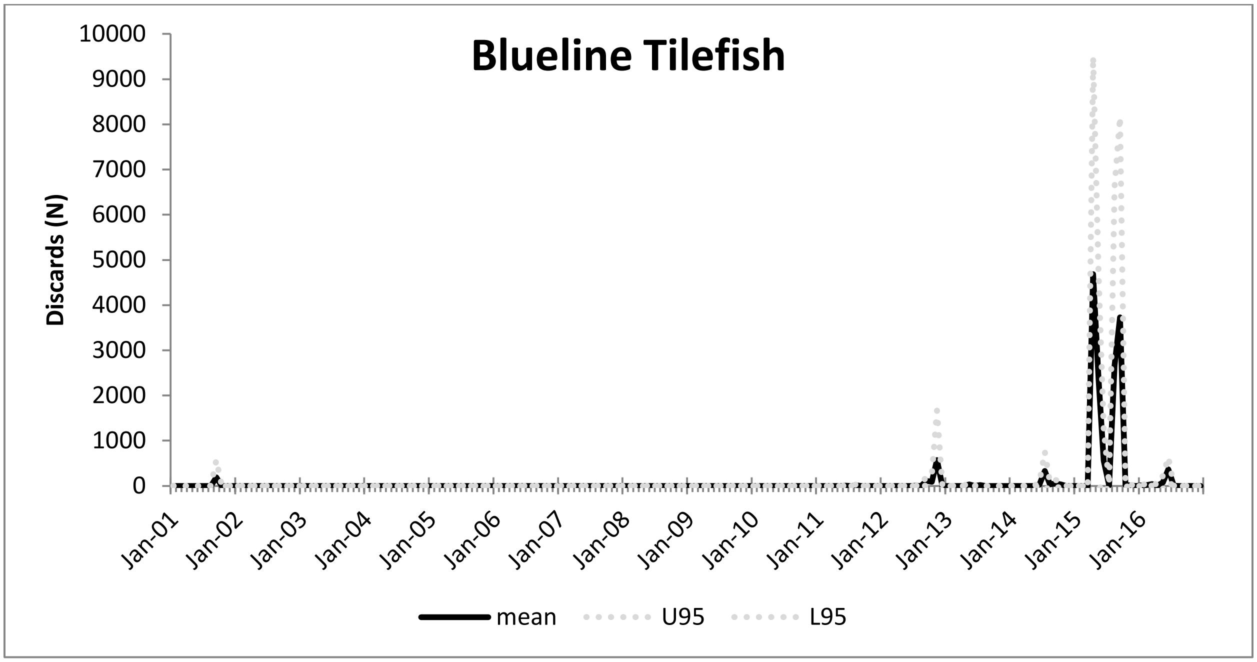


Figure S-1. Blueline tilefish expanded monthly commercial discard estimates (numbers of fish) from the SEFSC Supplemental Commercial Discard Logbook (accessed May 2017). Black line denotes mean, dotted lines denote 95% confidence limits for estimate.

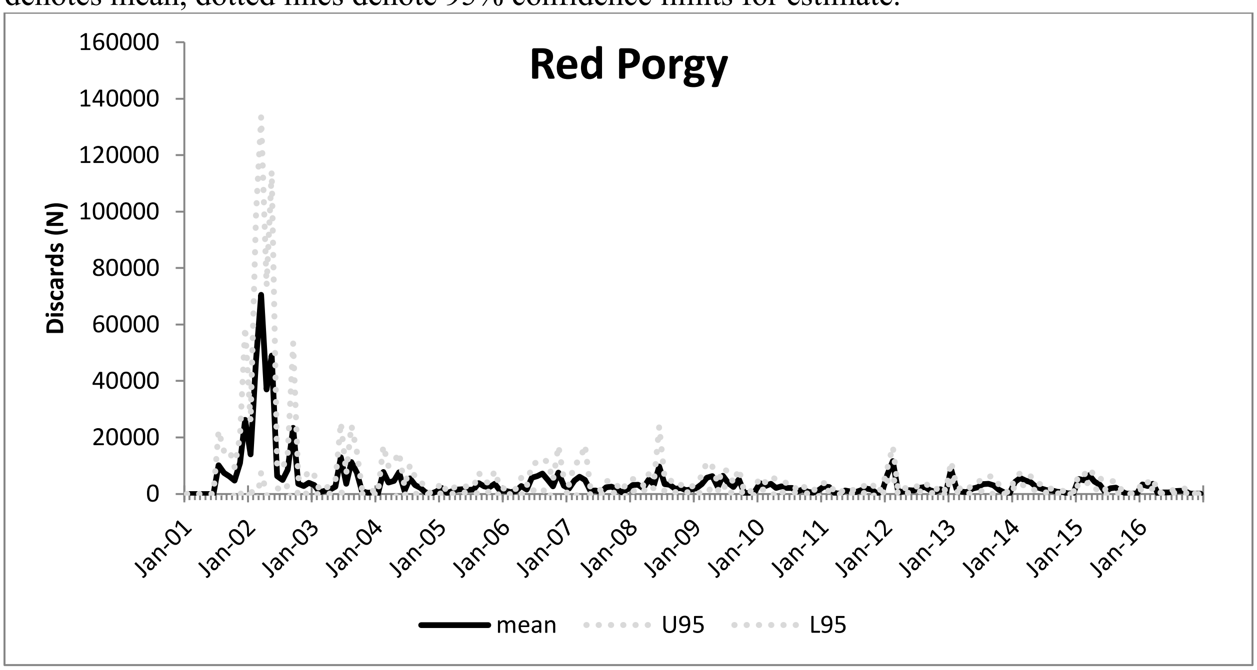


Figure S-2. Red porgy expanded monthly commercial discard estimates (numbers of fish) from the SEFSC Supplemental Commercial Discard Logbook (accessed May 2017). Black line denotes mean, dotted lines denote 95% confidence limits for estimate.

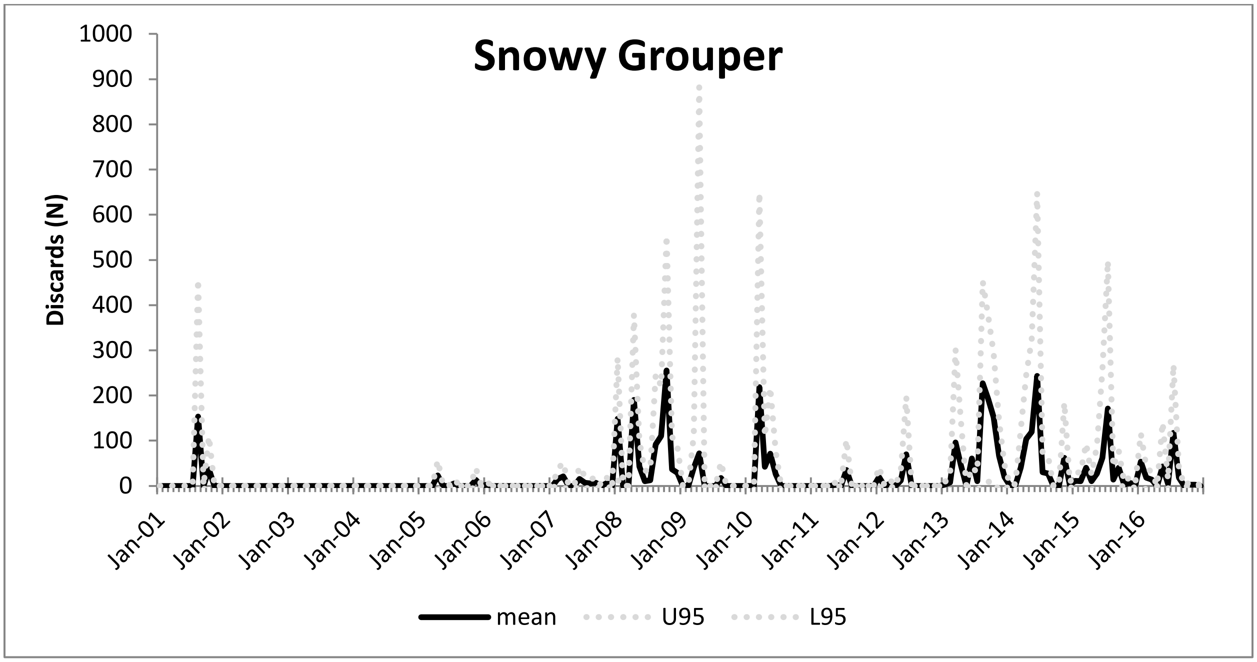


Figure S-3. Snowy grouper expanded monthly commercial discard estimates (numbers of fish) from the SEFSC Supplemental Commercial Discard Logbook (accessed May 2017). Black line denotes mean, dotted lines denote 95% confidence limits for estimate.

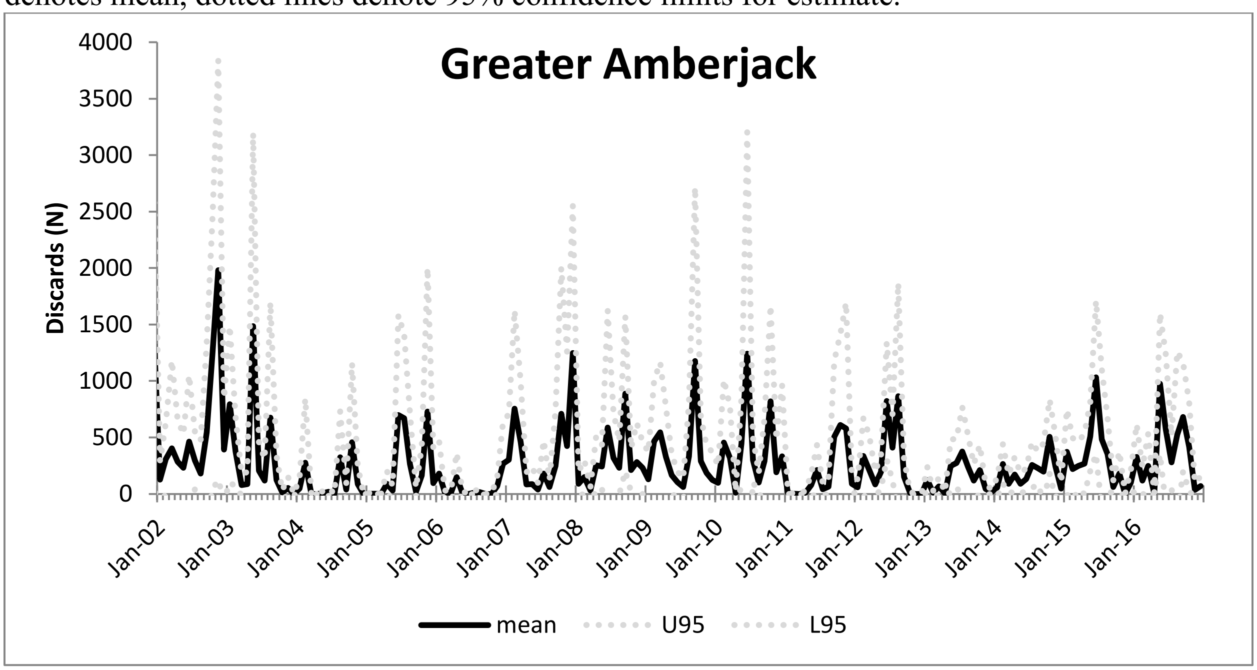


Figure S-4. Greater amberjack expanded monthly commercial discard estimates (numbers of fish) from the SEFSC Supplemental Commercial Discard Logbook (accessed May 2017). Black line denotes mean, dotted lines denote 95% confidence limits for estimate.

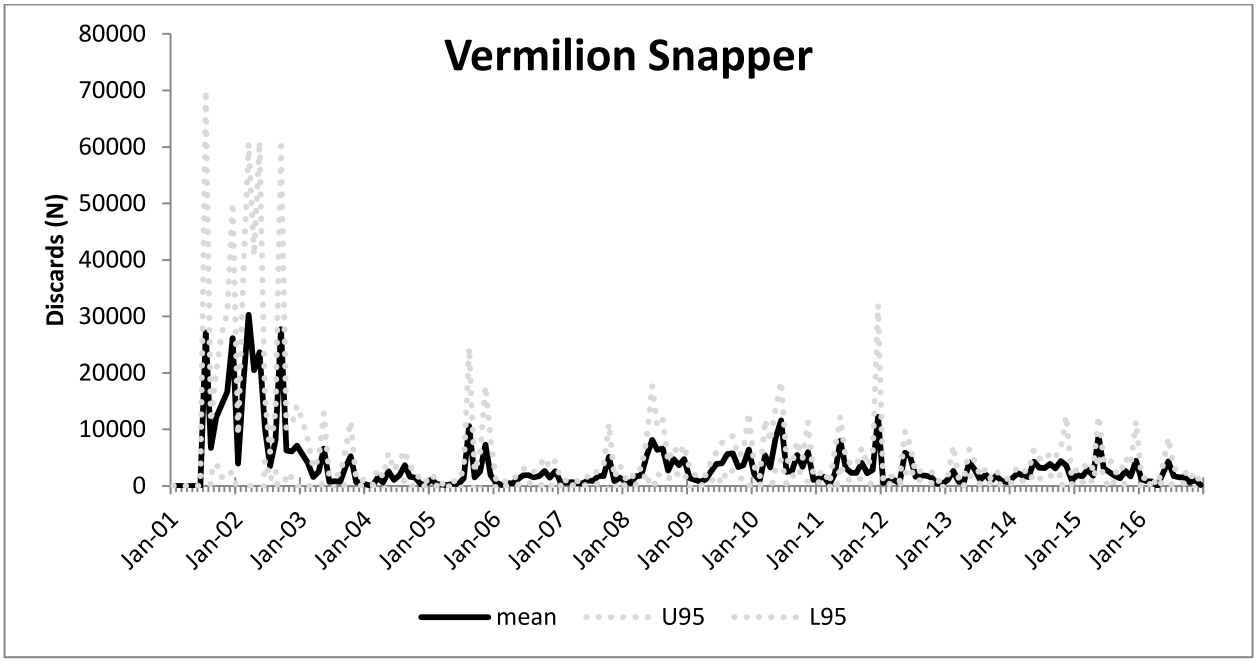


Figure S-5. Vermilion snapper expanded monthly commercial discard estimates (numbers of fish) from the SEFSC Supplemental Commercial Discard Logbook (accessed May 2017). Black line denotes mean, dotted lines denote 95% confidence limits for estimate.

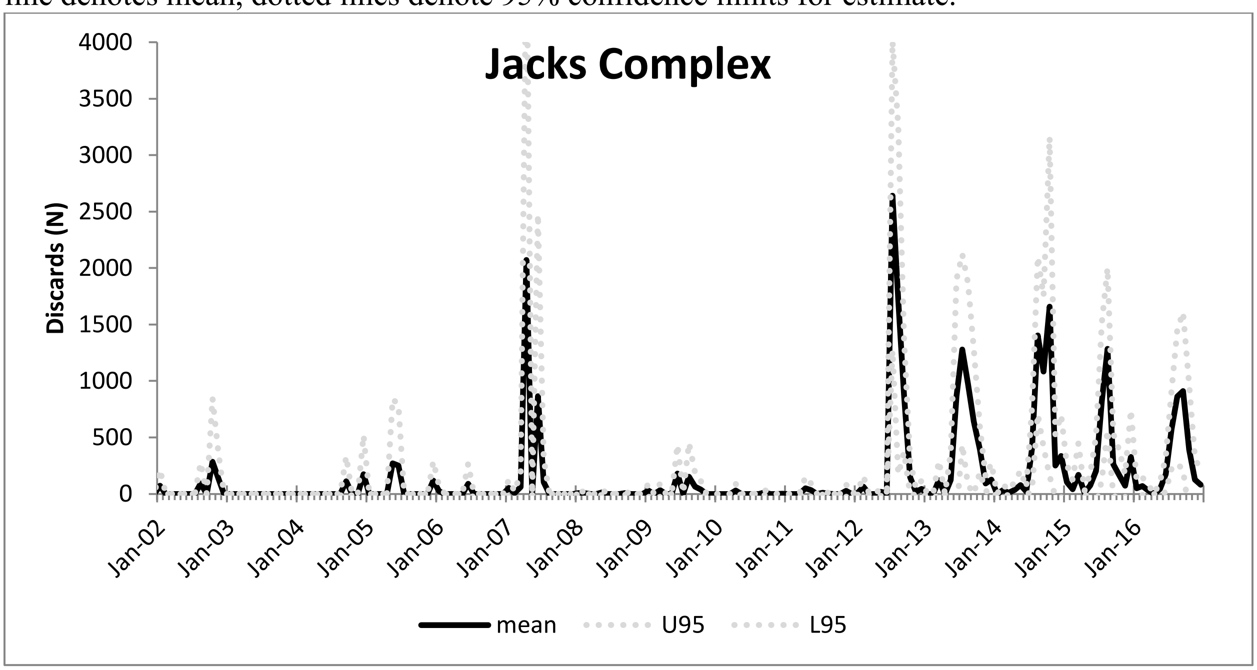


Figure S-6. Jacks complex (lesser amberjack, banded rudderfish, almaco jack) expanded monthly commercial discard estimates (numbers of fish) from the SEFSC Supplemental Commercial Discard Logbook (accessed May 2017). Black line denotes mean, dotted lines denote 95% confidence limits for estimate.

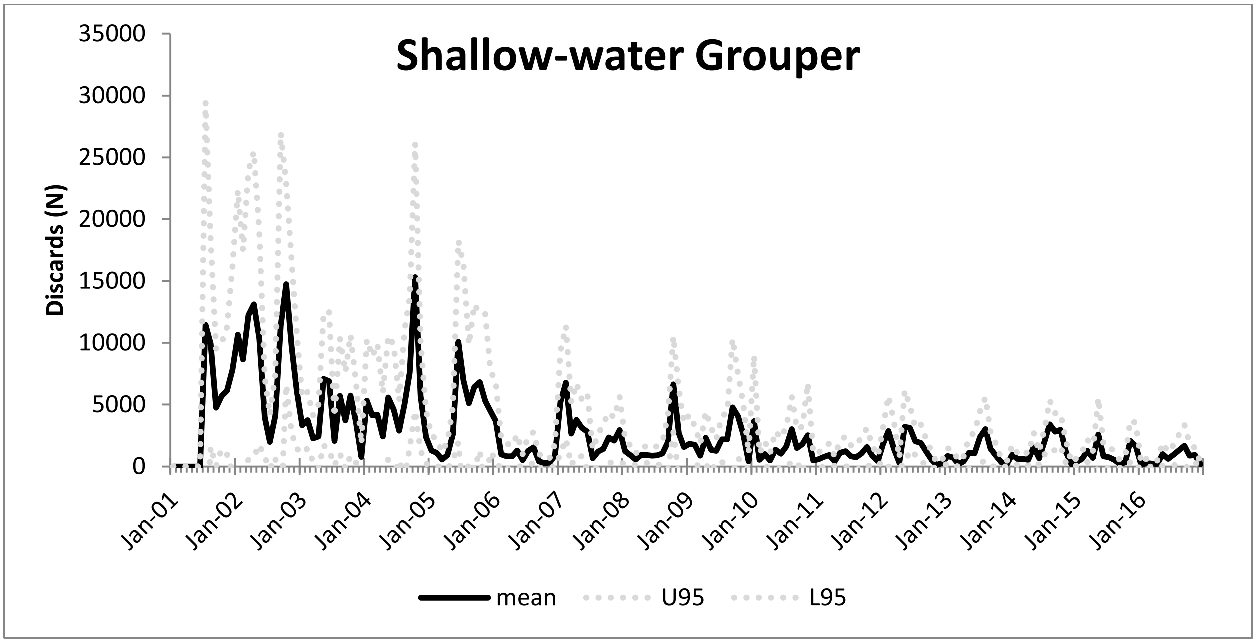


Figure S-7. Shallow-water grouper (gag, black grouper, scamp, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, graysby, and coney) expanded monthly commercial discard estimates (numbers of fish) from the SEFSC Supplemental Commercial Discard Logbook (accessed May 2017). Black line denotes mean, dotted lines denote 95% confidence limits for estimate.

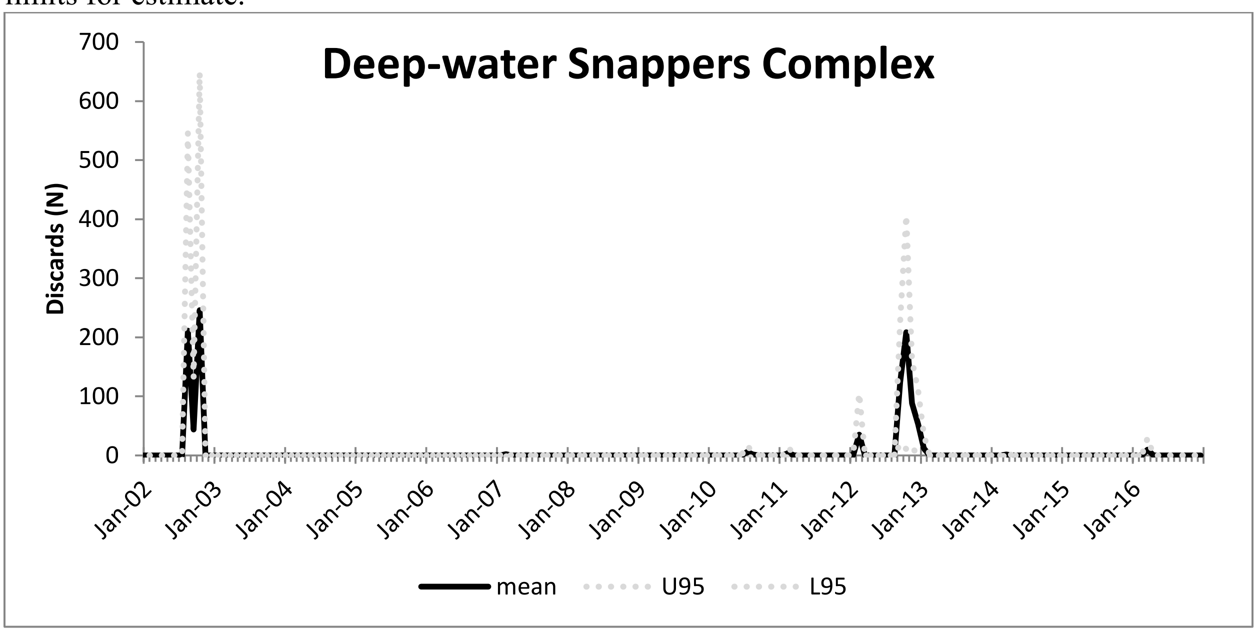


Figure S-8. Deep-water snapper (queen snapper, silk snapper, blackfin snapper) expanded monthly commercial discard estimates (numbers of fish) from the SEFSC Supplemental Commercial Discard Logbook (accessed May 2017). Black line denotes mean, dotted lines denote 95% confidence limits for estimate.

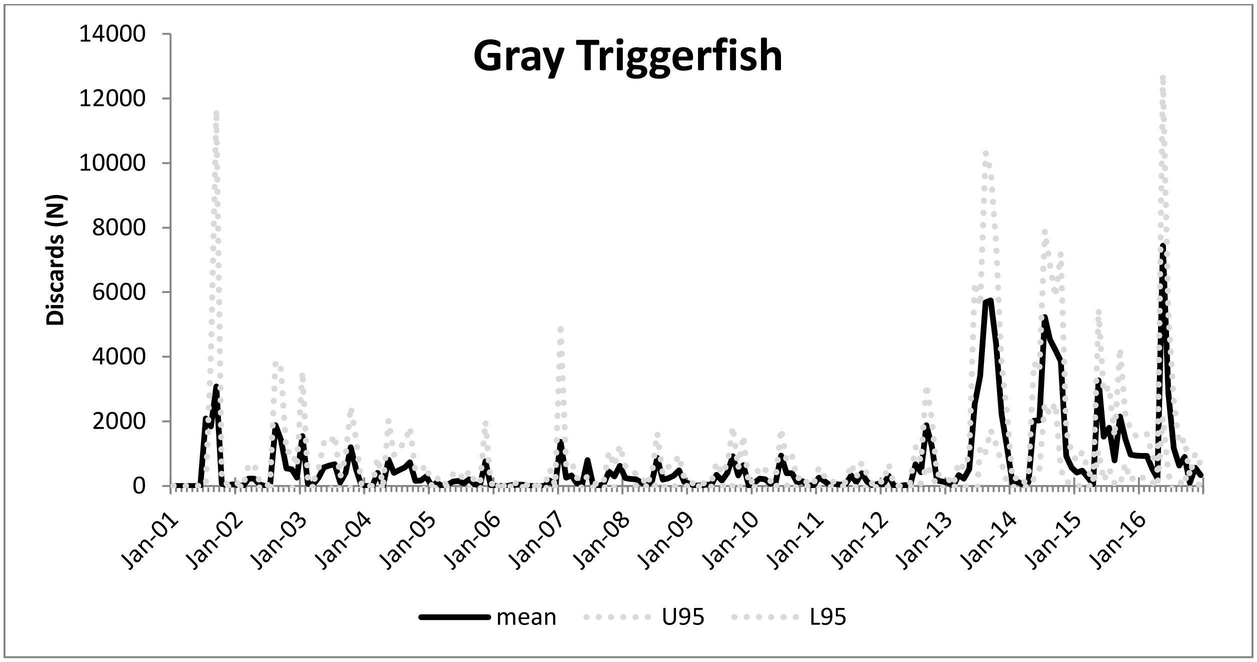


Figure S-9. Gray triggerfish expanded monthly commercial discard estimates (numbers of fish) from the SEFSC Supplemental Commercial Discard Logbook (accessed May 2017). Black line denotes mean, dotted lines denote 95% confidence limits for estimate. Note an outlier was removed for trolling gear in Nov 2006.

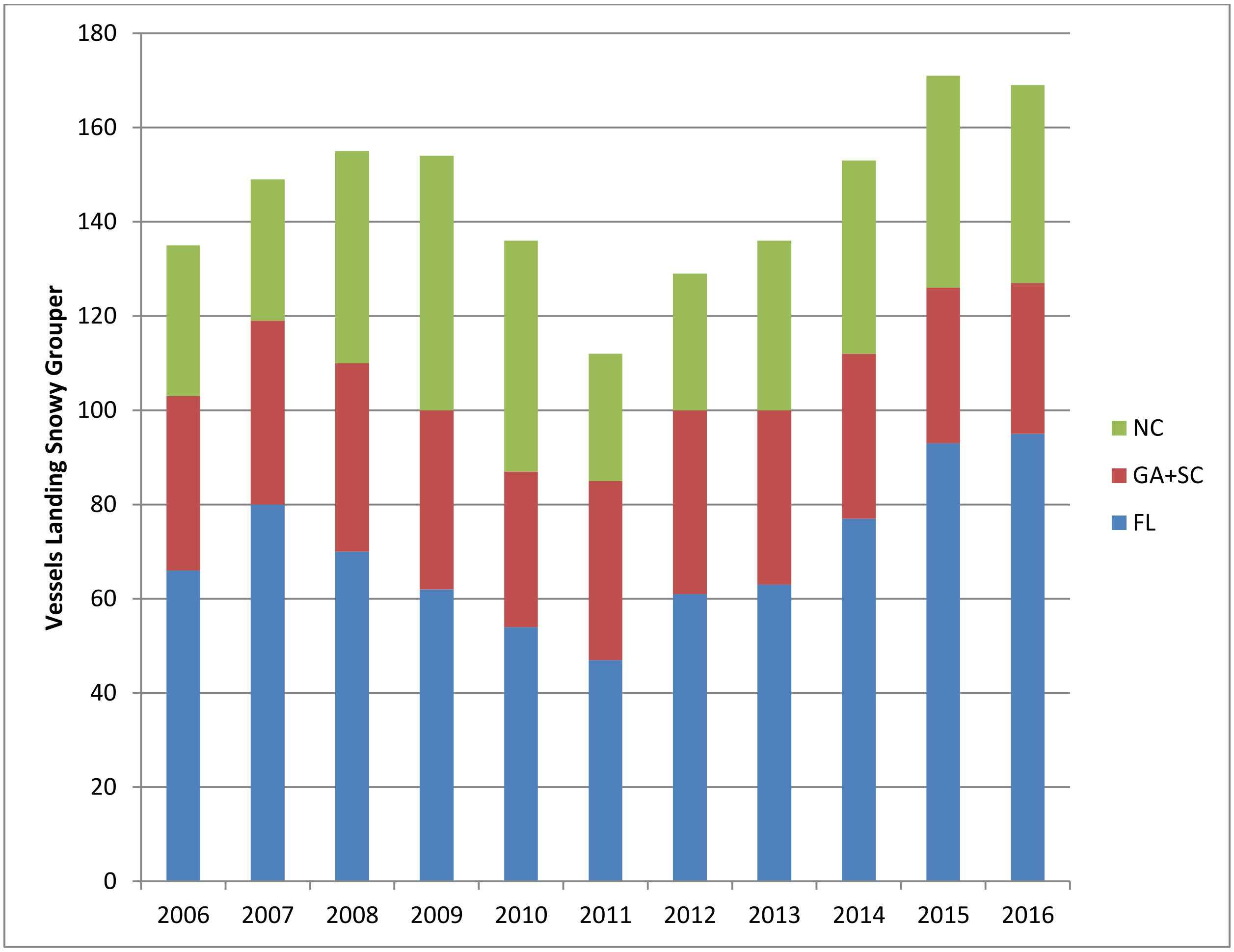


Figure S-10. Number of vessels reporting landings of snowy grouper, by state and year. Note that Georgia and South Carolina have been aggregated to protect confidentiality.

Appendix K. Commercial Data Analyses for Actions 6 & 7

Revised on 4/30/18

Data

For all the analyses, data from 2009 to 2011 and 2014 to 2016 was used. Three datasets were used to perform these analyses. Data from the Trip Intercept Program (TIP) was used to calculate average weights and length frequencies of Almaco Jack in the catch. The commercial Snapper Grouper logbook data was used to calculate daily catch rates of the fishery. Actual monthly landings were estimated using the Accumulated Landings System (ALS) data, which was used in conjunction with the catch rates estimated from the logbook data for estimating closure dates and harvest under each of the alternative trip and size limits. It should be noted that by using data from 2009-2011 and 2014-2016, the assumption is being made that fishing behavior will continue as it has been in those years. It also assumes that Almaco Jack and those species in the Jacks Complex will have the same catchability and selectivity to the fishery as they did in the years used.

Methods

The TIP data was used to calculate the proportion of Almaco Jack above each of the alternative minimum sizes. First, a Length-Weight conversion was developed to fill in the weights for samples that had lengths only. All samples were pooled across 2014-2016. The length frequency distribution was then calculated using the weight of fish rather than the number of fish to calculate the frequency per length bin. This allowed for the direct calculation of the effects of the proposed minimum size limit alternatives from Action 6. The length composition of the catch was constructed for all gears combined (Figure 2).

From 2014 to 2016, the Jacks complex closed early, which affects this analysis. In 2014 it closed at the end of July, in 2015 it close at the end of June, and in 2016 it closed at the beginning of August. Therefore, data from previous years when there wasn't a closure need to be used to estimate the catch rate during the months when Jacks were closed in 2014-2016. The most recent 3 years when the Jacks complex was open year-round were 2009 to 2011. Data from August to December from 2009-2011 were used to fill in for the missing data from 2014-2016. The average across 2009-2011 was used to replace the missing data from July 2015.

For each of the size limit alternatives (20", 22", 24", and 26"), the proportion of Almaco Jack below that minimum size was calculated using the appropriate weight frequency distribution by length bin and then removed from each trip in the logbook dataset. This process effectively created 5 datasets to use in the rest of the analyses, one for the no action and one for each size limit. Estimated landings and 95% confidence intervals (CI) were calculated for each minimum size alternative using the modified logbook data. The CI were calculated using variances calculated at a monthly timescale and then summed to get the variance estimate at the yearly timescale. This was done for several reasons. First, it was felt that calculating the variance at the yearly scale directly was considerably underestimating the true variance in the data. Another reason is that the data used to calculate closure dates was at the monthly level, so using the monthly timescale for the variance in the overall estimated landings made these 2 calculations comparable.

The analysis for the trip limit sub-alternatives under Action 7, alternative 3 was done in much the same way the minimum size alternatives were done. The logbook data was analyzed trip by trip to look at the total weight of the Jacks Complex (Jacks) on each trip. If the weight of Jacks on a trip was less than the proposed trip limit, then no alteration was made. However, if the weight of Jacks on a trip was above the proposed trip limit alternative, then the weight of Jacks was set equal to the new trip limit. This was done for each of the minimum size datasets.
The sub-alternatives under Action 7, alternative 2 were a bit more complex, but had the same basic principle. Step-downs were incorporated into the analysis by first sorting the logbook data by trip date. A cumulative landings column needed to be added to keep track of what proportion of the ACL had been caught when each trip was analyzed. If less than 75% of the commercial ACL has been caught, the trip limit is used in the analysis. However, if 75% or more of the commercial ACL has been caught, the step-down is used in the analysis.

For calculating potential closure dates, the logbook data was used to calculate the proportion of landings per day of each month for each alternative under Action 7. The actual landings are calculated using the ALS dataset to obtain the average landings across the years for each month and multiplying that by the proportion of landings caught in each day for each of the 5 datasets across each of the alternatives under Action 6. The daily landings are then summed cumulatively until either the commercial ACL is reached or the end of the year is reached. The 95% CI was calculated for each month in the same manner as was described above for the minimum size alternatives. The upper and lower CI values for each month were divided by the number of days in each month to get the estimated landing per day. The assumption here is that the daily catch rate is divided evenly throughout the month. The analysis proceeded in the same manner as the analysis of the average estimates.

One important caveat to the analysis involving the step-downs is that it was conducted without any implementation error. This means the assumption was made that the step-down went into effect at the precise moment that the landings reached 75% of the commercial ACL. In practice, this is most likely not reflective of what happens in the fishery due to the lag time in reporting, late reporting, and misreporting.

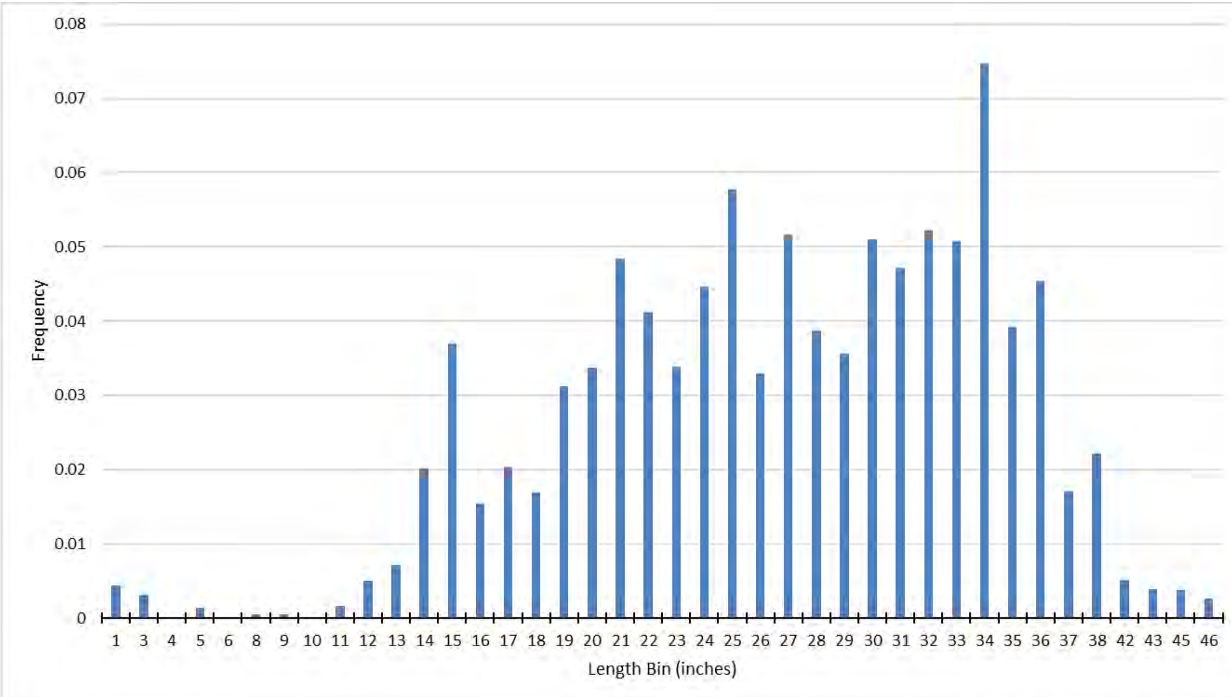


Figure 2. Length frequency of Almaco Jack catch from the TIP data using weight instead of numbers to calculate the frequency per bin.

<u>Results</u>

To see the relative effect of the Almaco Jack minimum size limit, the average annual landings of Jacks for 2014-2016 were calculated for each alternative under Action 6 (Figure 4.6.1.1). Figure 4.6.1.1 shows that as the minimum size of Almaco Jack increases, the estimated annual landings of Jacks decreases. However, if left open year-round, none of the alternative minimum sizes keeps the annual landings of Jacks below the commercial ACL by itself.

Table 4.6.1.1 shows the estimated closure dates and 95% CI for the minimum size alternatives under Action 6. As can be seen from the size of the 95% CI, these closure dates have been estimated with a high degree of uncertainty.

The sub-alternatives under Action 7, alternative 3 were analyzed for each of the alternative minimum size limits under Action 6. The relative effect of each trip limit under each size limit is depicted in Figure 4 below. The trip limits have the expected effect of reducing the estimated landings of Jacks as the trip limit gets smaller. Within each trip limit sub-alternative, the size limit of Almaco Jack has the same basic pattern as it did when no trip limit was imposed. As the size limit increases, the estimated landings of Jacks decrease. However, the 95% CI for each bar in the graph are wide and overlap many of the other alternatives, making it difficult to definitively determine the true effects of each alternative combination under Actions 6 and 7.

Table shows the estimated closure dates and 95% CI for each of the trip limits under Action 7, alternative 3. Each of these sub-alternatives was analyzed under each of the size limits under Action 6. Again the 95% CI are very wide and are even wider here than when only looking at the effects of the minimum size of Almaco Jack in Action 6. This is due to the compounding uncertainty of combining the analyses for minimum size and trip limit.

The sub-alternatives under Action 7, alternative 2 were analyzed in the same manner as they were for alternative 3. The relative effect of each trip limit under each size limit is depicted in Figure 5 below. The effect of the trip limit with the step-down has the same trend as the trip limit without using a step-down. The difference is the total estimated landings of Jacks for alternative 2 is lower for each sub-alternative than for alternative 3 under Action 7. Again, the 95% CI show a high degree of uncertainty in these estimates. An important caveat to keep in mind when interpreting these results is that this analysis was performed assuming no implementation error. This means that the moment the landings reached 75% of the commercial ACL, the step-down was immediately implemented for all trips following that. In practice, there is a time lag between when 75% of the ACL is actually landed by the fishery and when the step-down can truly be implemented fishery-wide.

Table 4 shows the estimated closure dates and 95% CI for each of the trip limits and step-downs under Action 7, alternative 2. Again the 95% CI are very wide due to the same reasons talked about for alternative 3 since this analysis was performed using the same methodology. A column was added for estimated harvest because this is the only analysis that had a scenario for which the fishery was not predicted to close. If it was predicted to close, it was assumed the ACL was harvested.

To help put these closure dates in perspective, the average monthly landings of Jacks for 2014-2016 were estimated using the logbook data, with 95% CI (Figure 6). The monthly landings show a clear pattern, or season, for Jacks that starts in April and is over by August. The rest of the year has Jacks landings, but at a much lower level. It should also be noted that the 95% CI around these monthly estimates are very wide and include zero for several of the months.

Table 2. Estimated closure dates and 95% CI for the alternative Almaco Jack minimum sizes under Action 6.

Alt Num	Alternatives	Closure Date	Lower 95%	Upper 95%
1	No Size Limit	6/11	5/23	9/16
2	20 in	6/12	5/24	9/29
3	22 in	6/13	5/25	10/19
4	24 in	6/16	5/28	12/23
5	26 in	6/24	6/3	None

Table 3. Estimated closure dates and 95% CI for each sub-alternative under Action 7, alternative 3 analyzed under each alternative under Action 6.

Action 7 Alt	Action 6 Alt	Alternatives	Closure Date	Lower 95%	Upper 95%
3a	1	500 lbs, No Size Lim	7/1	6/9	None
3a	2	500 lbs, 20 in	7/3	6/10	None
3a	3	500 lbs, 22 in	7/5	6/11	None
3a	4	500 lbs, 24 in	7/13	6/15	None
3a	5	500 lbs, 26 in	7/30	6/27	None
3b	1	400 lbs, No Size Lim	7/13	6/16	None
3b	2	400 lbs, 20 in	7/14	6/17	None
3b	3	400 lbs, 22 in	7/15	6/17	None
3b	4	400 lbs, 24 in	7/27	6/22	None
3b	5	400 lbs, 26 in	9/3	6/29	None
3c	1	300 lbs, No Size Lim	8/13	6/27	None
3c	2	300 lbs, 20 in	8/21	6/28	None
3c	3	300 lbs, 22 in	8/25	6/29	None
3c	4	300 lbs, 24 in	10/1	7/4	None
3c	5	300 lbs, 26 in	12/6	7/12	None

Table 4. Estimated closure dates and 95% CI for each sub-alternative under Action 7, alternative 2 analyzed under each alternative under Action 6. Harvest is the estimated landings of Jacks in lbs. ww under each scenario.

Action 7 Alt	Action 6 Alt	Alternatives	Closure Date	Harvest	Lower 95%	Upper 95%
2a	1	500/250, No Size Lim	7/14	182,137	6/14	None
2a	2	500/250, 20 in	7/17	182,137	6/15	None
2a	3	500/250, 22 in	7/19	182,137	6/16	None
2a	4	500/250, 24 in	8/1	182,137	6/21	None
2a	5	500/250, 26 in	9/11	182,137	6/27	None
2b	1	400/200, No Size Lim	8/5	182,137	6/22	None
2b	2	400/200, 20 in	8/11	182,137	6/23	None
2b	3	400/200, 22 in	8/17	182,137	6/24	None
2b	4	400/200, 24 in	9/15	182,137	6/28	None
2b	5	400/200, 26 in	11/13	182,137	7/6	None
2c	1	300/150, No Size Lim	11/5	182,137	7/5	None
2c	2	300/150, 20 in	11/11	182,137	7/6	None
2c	3	300/150, 22 in	11/15	182,137	7/7	None
2c	4	300/150, 24 in	12/18	182,137	7/12	None
2c	5	300/150, 26 in	None	175,939	7/20	None

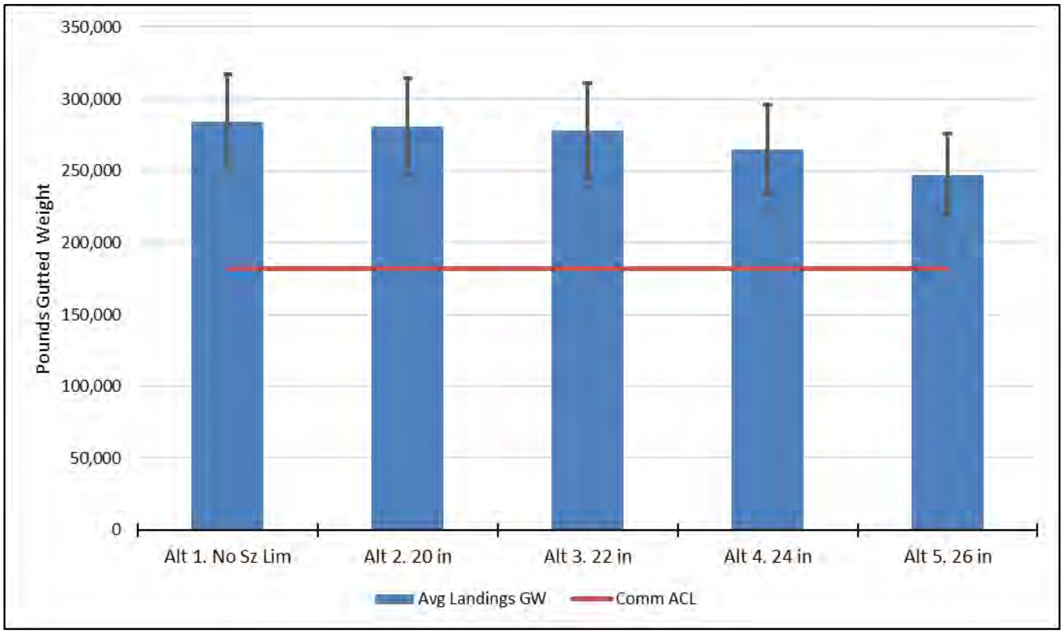


Figure 3. Estimated annual commercial landings of the Jacks Complex for each of the alternative Almaco Jack minimum sizes under Action 6 with 95% CI and the commercial ACL for reference.

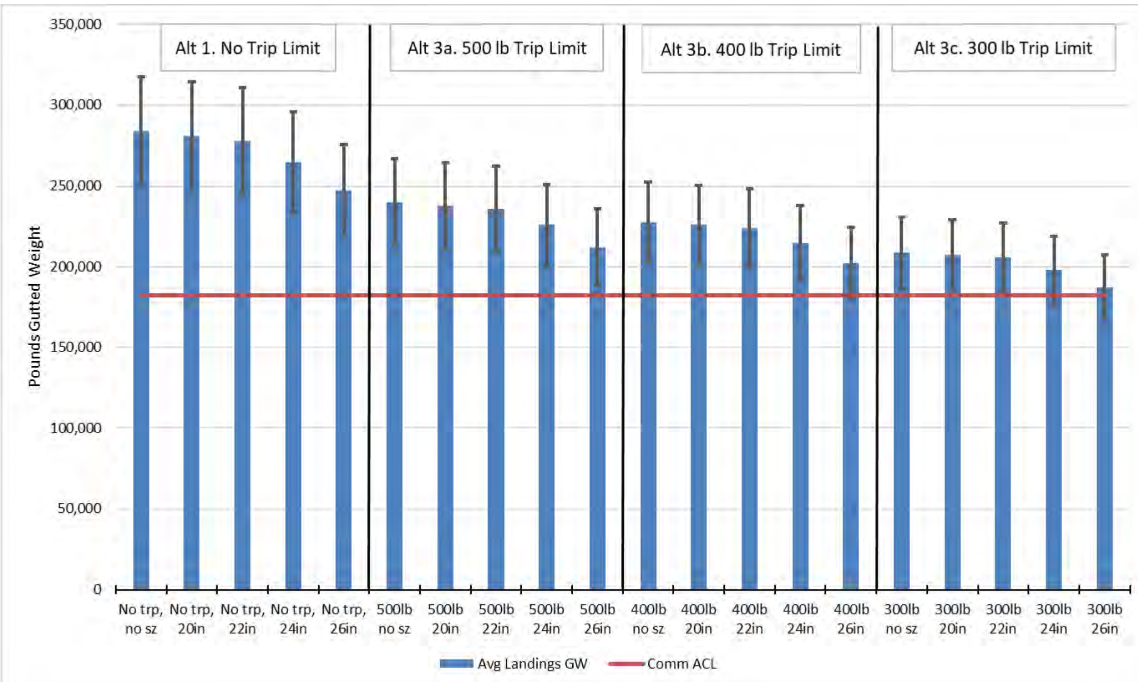


Figure 4. Estimated annual commercial landings of the Jacks Complex for each of the trip limit sub-alternatives under Action 7, alternative 3. Each sub-alternative from Action 7 was analyzed for each of the Almaco Jack minimum size alternatives under Action 6.

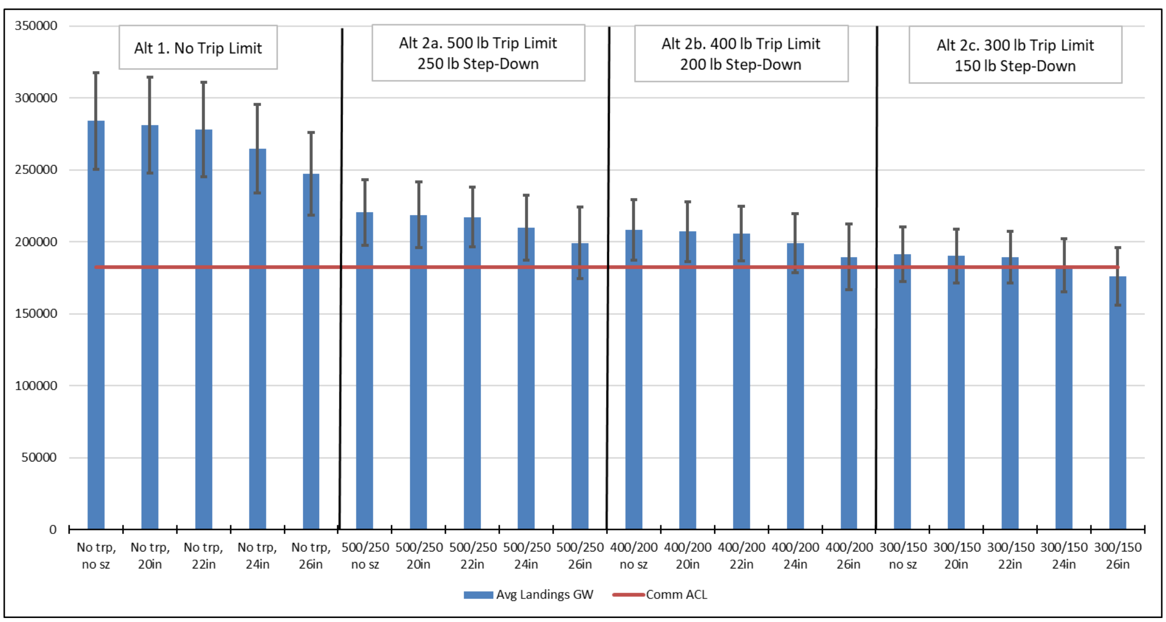


Figure 5. Estimated annual commercial landings of the Jacks Complex for each of the trip limit/step-down sub-alternatives under Action 7, alternative 2. Each sub-alternative from Action 7 was analyzed for each of the Almaco Jack minimum size alternatives under Action 6.

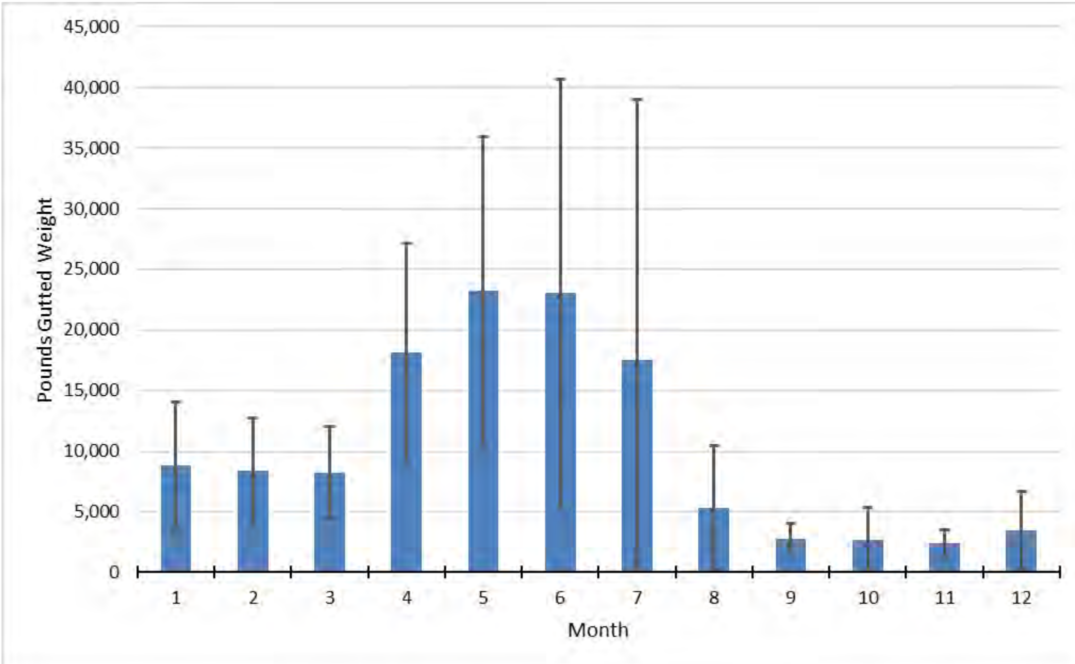


Figure 6. Estimated average monthly landings of Jacks 2014-2016 with 95% CI.

Appendix L. Spatial distribution of commercial landings for select species

Blueline Tilefish

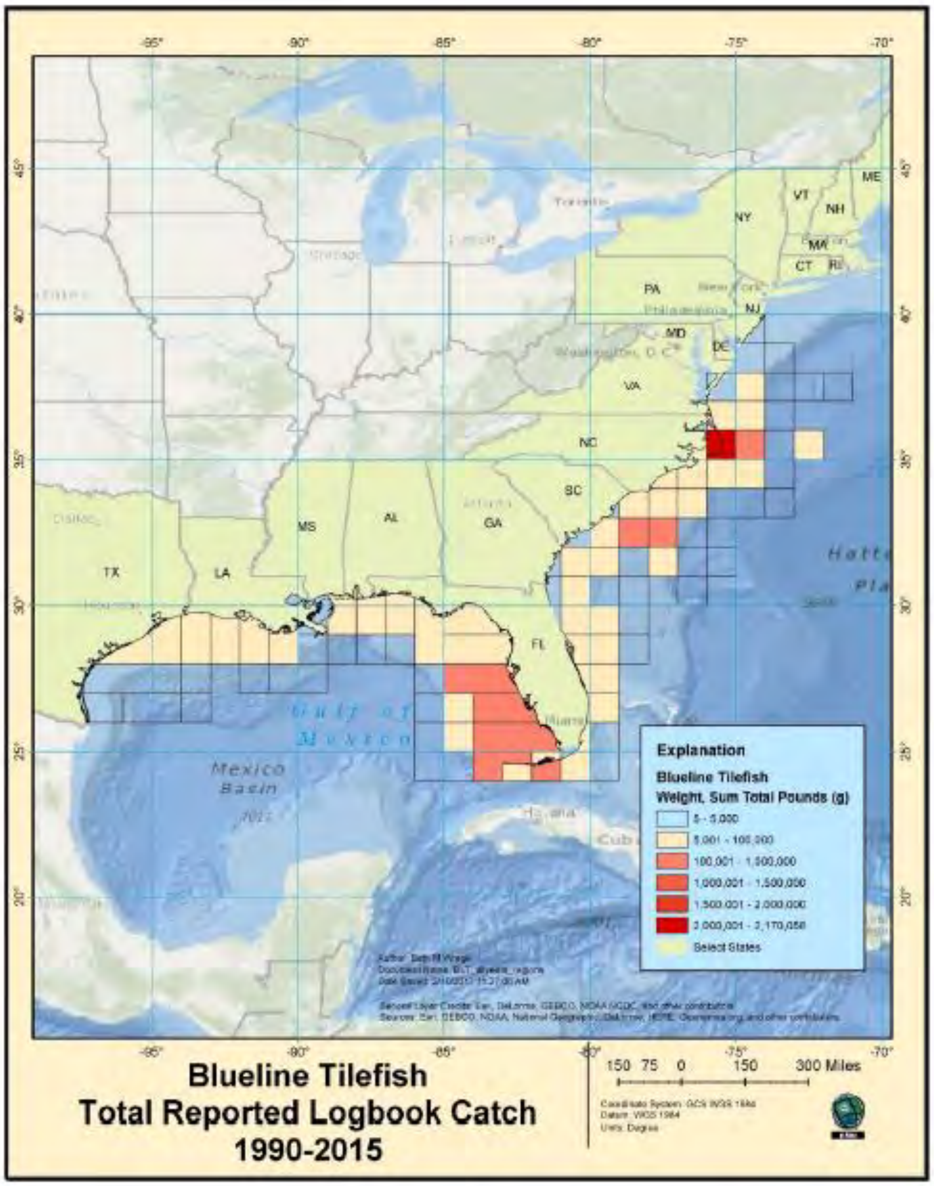
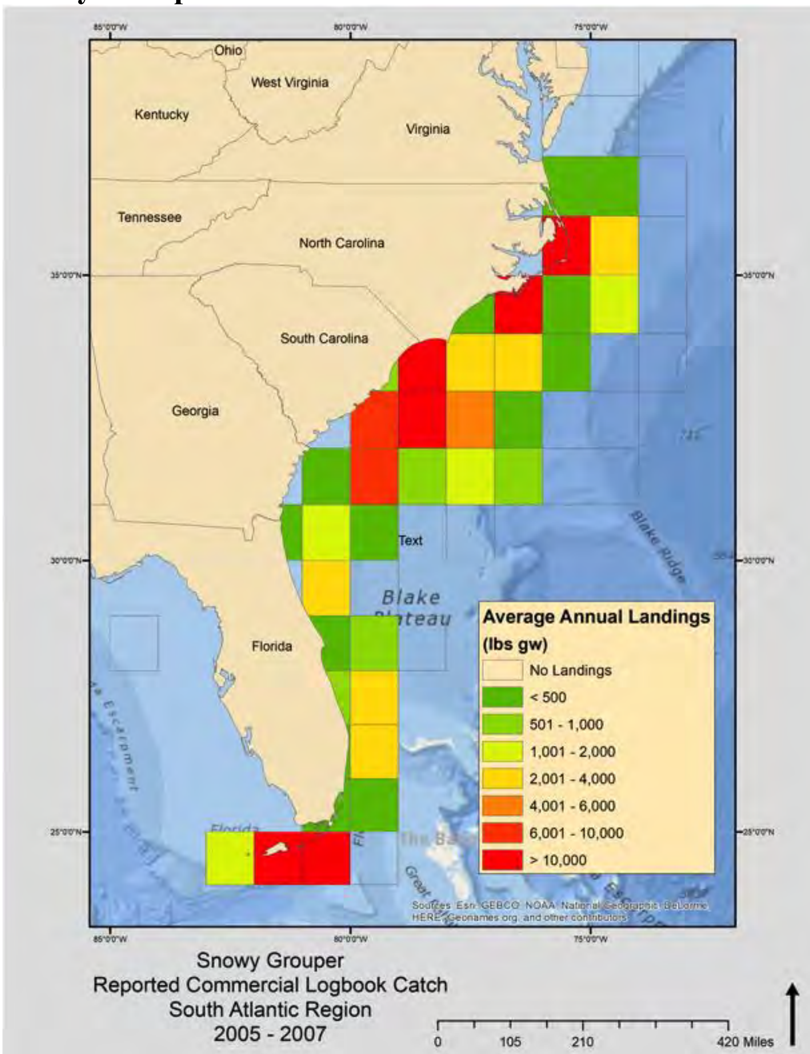
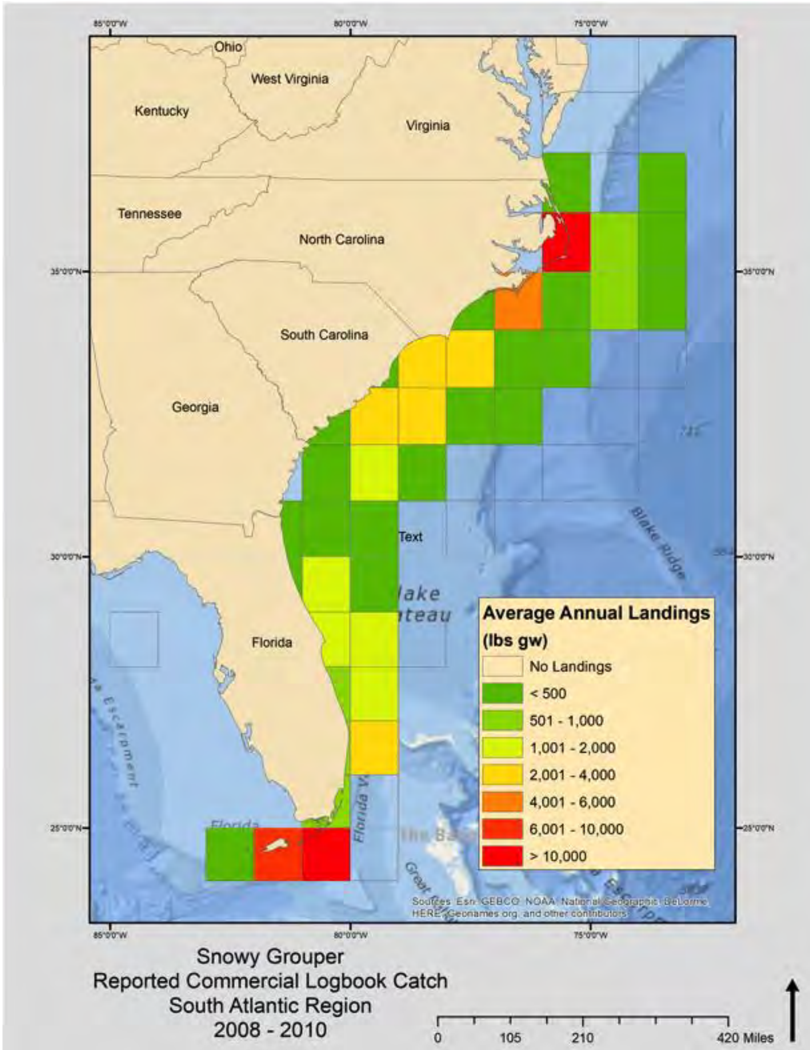
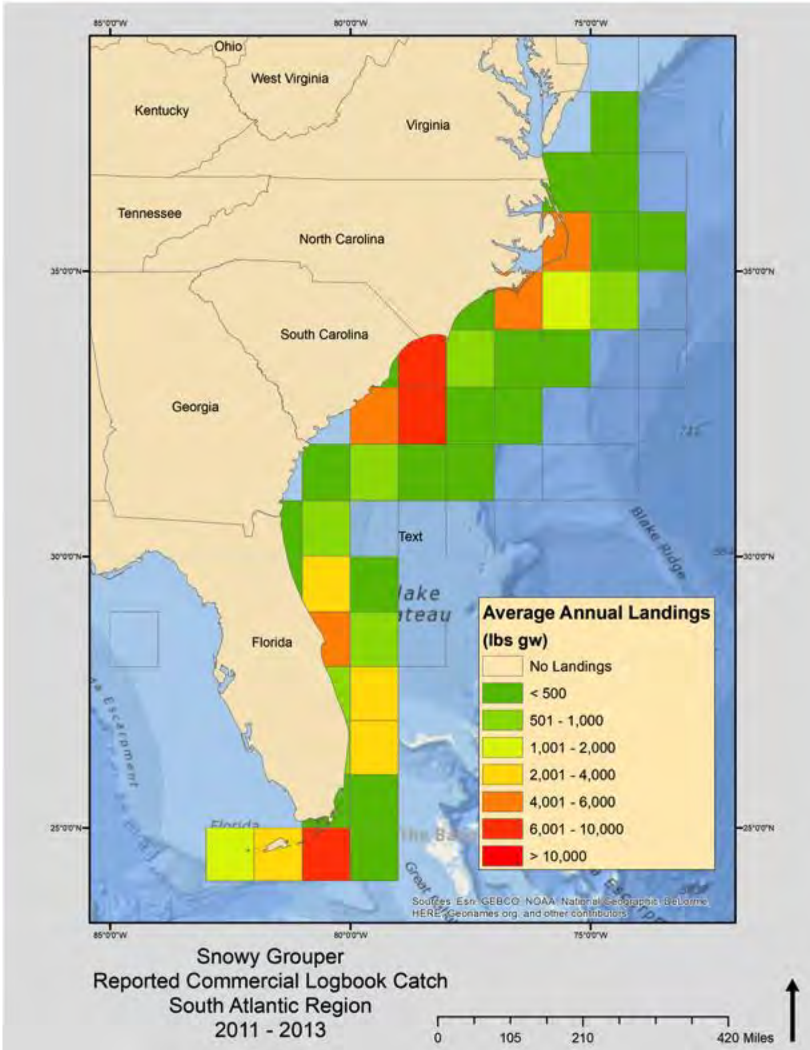


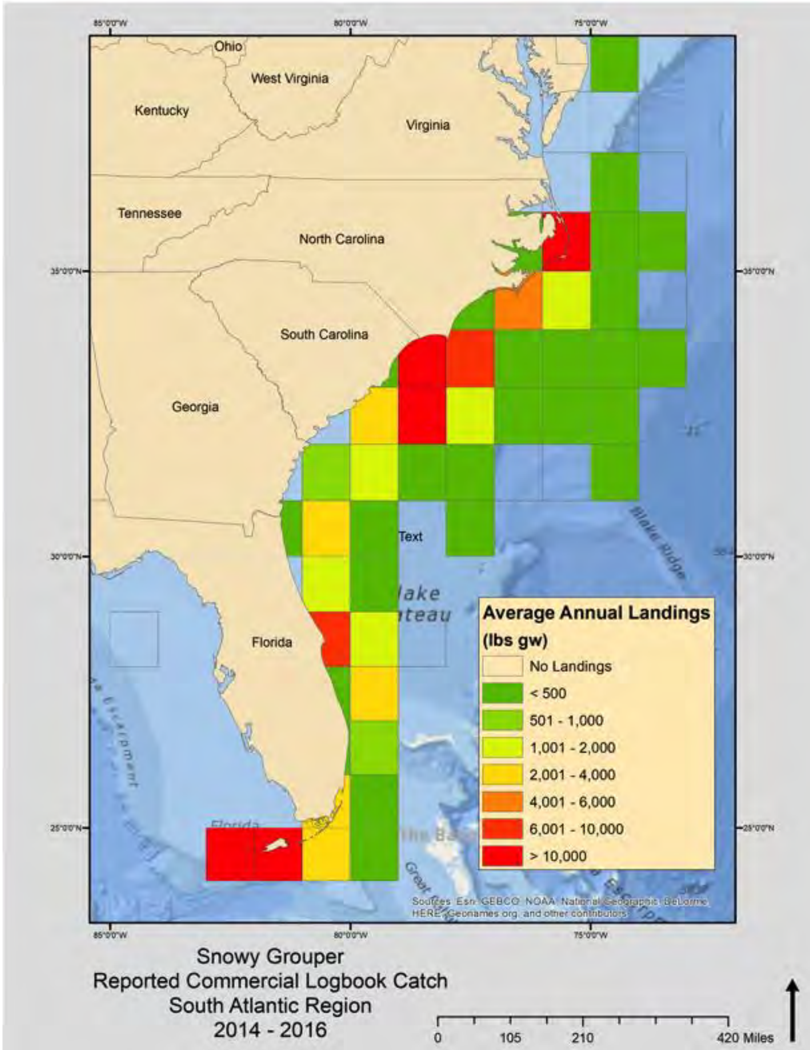
Figure 3.1 Map of Blueline Tilefish harvest in the Atlantic and Gulf of Mexico as reported to the CFLP and VTR

Snowy Grouper

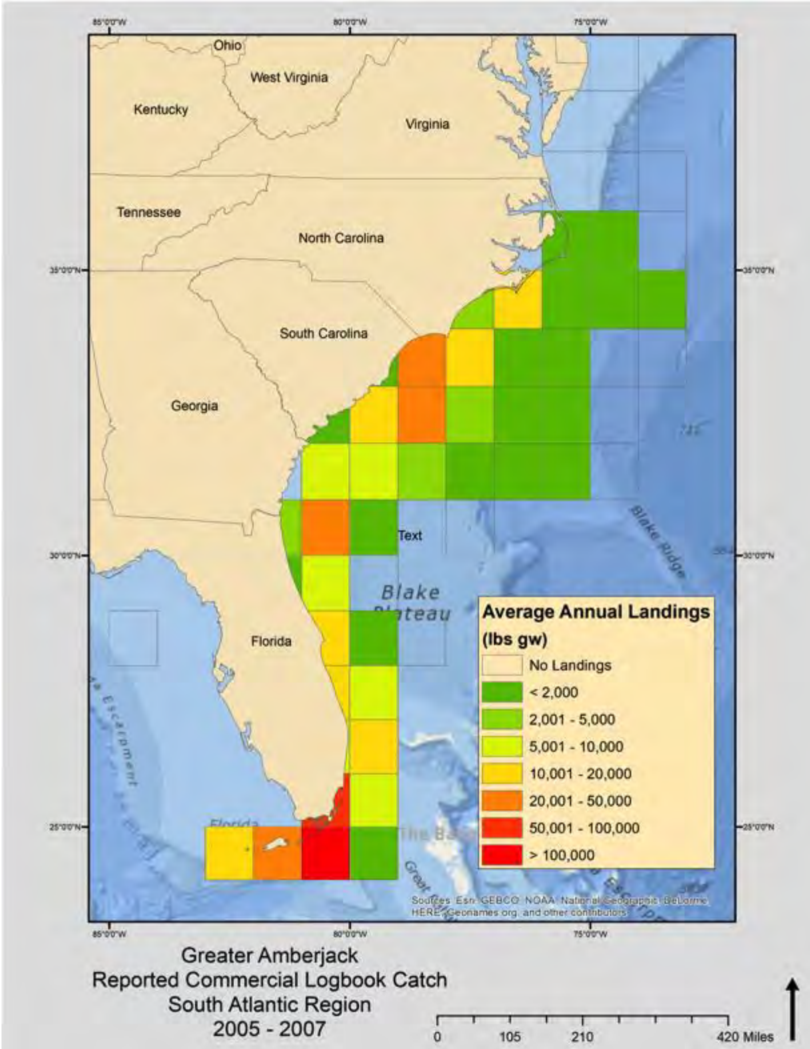


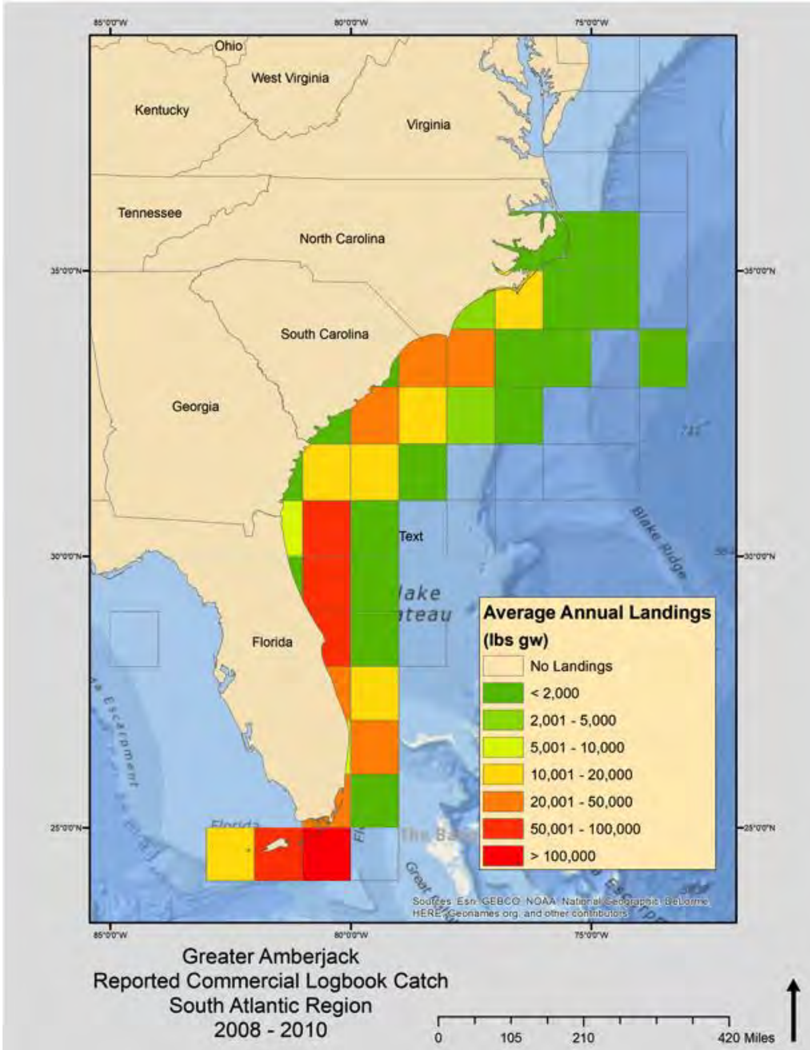

Ohio
West Virginia
Kentucky
Virginia
Tennessee
North Carolina
South Carolina
Georgia
Florida
Blake Ridge
Text
Average Annual Landings (lbs gw)
No Landings
< 500
501 - 1,000
1,001 - 2,000
2,001 - 4,000
4,001 - 6,000
6,001 - 10,000
> 10,000
Snowy Grouper
Reported Commercial Logbook Catch
South Atlantic Region
2008 - 2010
0
105
210
420 Miles

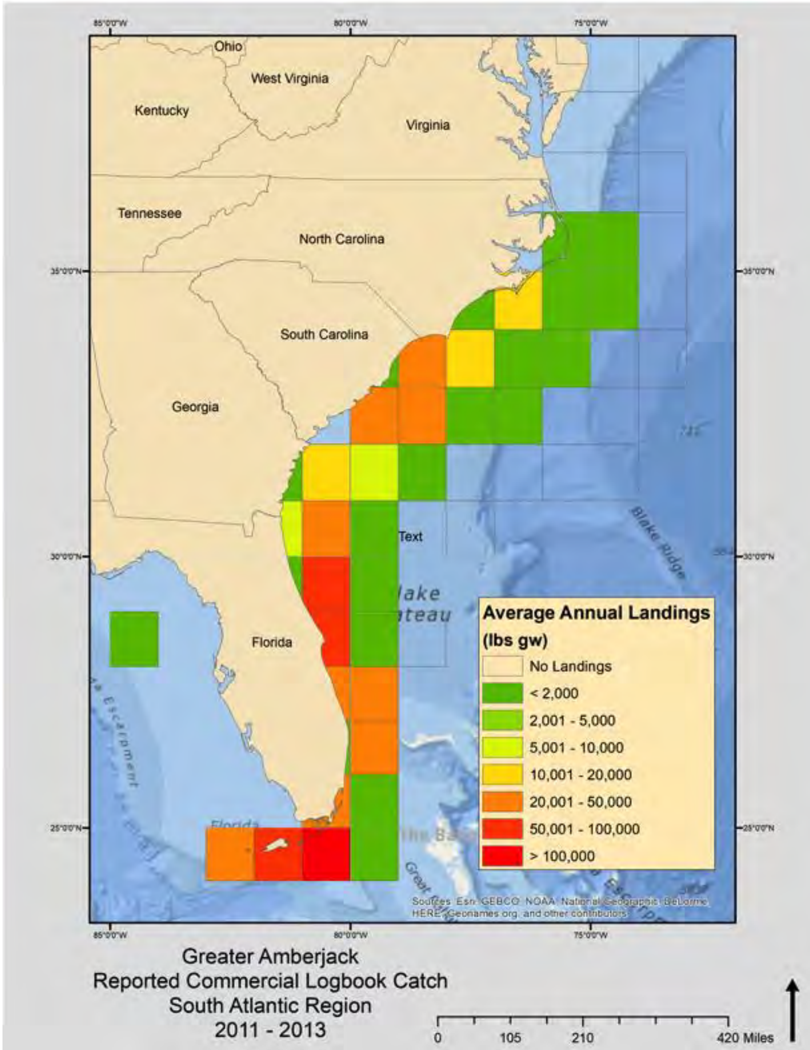

Ohio
West Virginia
Kentucky
Virginia
Tennessee
North Carolina
South Carolina
Georgia
Florida
Text
Blake Ridge
Average Annual Landings
(lbs gw)
No Landings
< 500
501 - 1,000
1,001 - 2,000
2,001 - 4,000
4,001 - 6,000
6,001 - 10,000
> 10,000
Snowy Grouper
Reported Commercial Logbook Catch
South Atlantic Region
2011 - 2013
0
105
210
420 Miles


Ohio
West Virginia
Kentucky
Virginia
Tennessee
North Carolina
South Carolina
Georgia
Florida
Text
Average Annual Landings
(lbs gw)
No Landings
< 500
501 - 1,000
1,001 - 2,000
2,001 - 4,000
4,001 - 6,000
6,001 - 10,000
> 10,000
Snowy Grouper
Reported Commercial Logbook Catch
South Atlantic Region
2014 - 2016
0
105
210
420 Miles

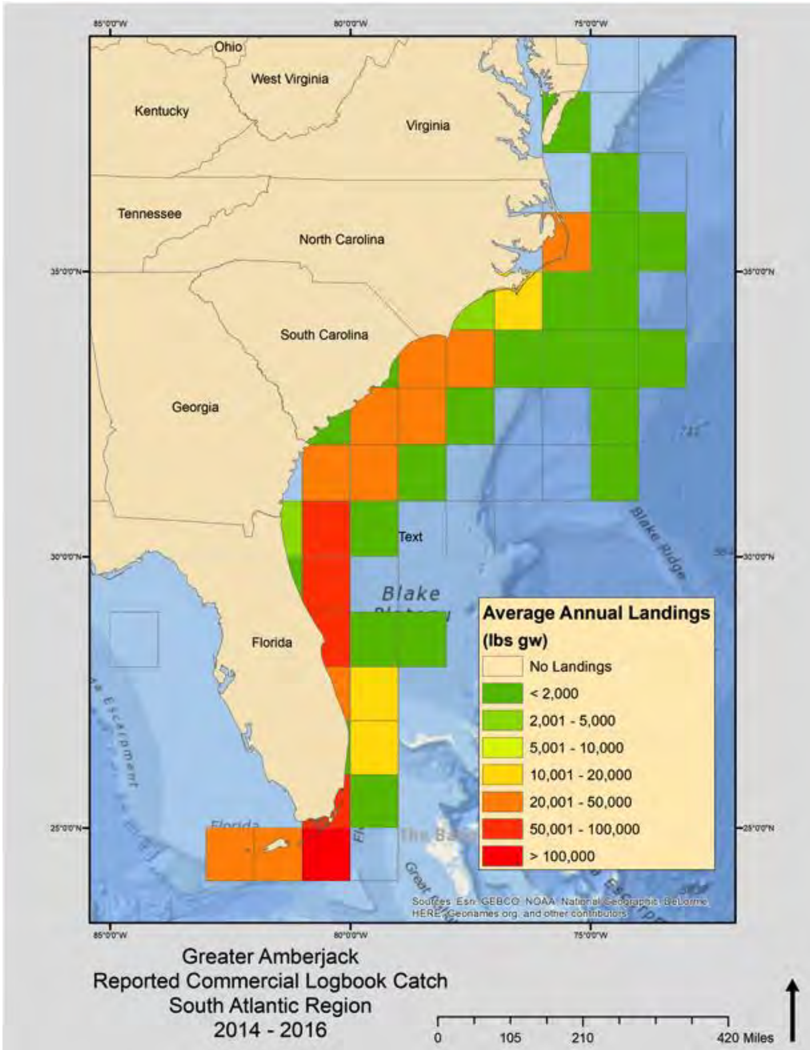
Greater Amberjack




Ohio
West Virginia
Kentucky
Virginia
Tennessee
North Carolina
South Carolina
Georgia
Florida
Text
Blake Ridge
Average Annual Landings (lbs gw)
No Landings
< 2,000
2,001 - 5,000
5,001 - 10,000
10,001 - 20,000
20,001 - 50,000
50,001 - 100,000
> 100,000
Sources: Esri, GEBCO, NOAA, National Geographic, DeLorme, HERE, Geonames.org, and other contributors
Greater Amberjack
Reported Commercial Logbook Catch
South Atlantic Region
2008 - 2010
0
105
210
420 Miles



Ohio
West Virginia
Kentucky
Virginia
Tennessee
North Carolina
South Carolina
Georgia
Florida
Blake Ridge
Average Annual Landings
(lbs gw)
No Landings
< 2,000
2,001 - 5,000
5,001 - 10,000
10,001 - 20,000
20,001 - 50,000
50,001 - 100,000
> 100,000
Greater Amberjack
Reported Commercial Logbook Catch
South Atlantic Region
2011 - 2013
0
105
210
420 Miles



Ohio
West Virginia
Kentucky
Virginia
Tennessee
North Carolina
South Carolina
Georgia
Florida
Text
Blake
Blake Ridge
Average Annual Landings
(lbs gw)
No Landings
< 2,000
2,001 - 5,000
5,001 - 10,000
10,001 - 20,000
20,001 - 50,000
50,001 - 100,000
> 100,000
Greater Amberjack
Reported Commercial Logbook Catch
South Atlantic Region
2014 - 2016
0
105
210
420 Miles