Regulatory Amendment 15 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region

Yellowtail Snapper and Shallow Water Groupers

Environmental Assessment **Regulatory Impact Review** **Regulatory Flexibility Act Analysis**

MARCH 2013

Definitions, Abbreviations, and Acronyms Used in the Document

ABC	acceptable biological catch
ACL	annual catch limits
AM	accountability measures
ACT	annual catch target
B	a measure of stock biomass in either weight or other appropriate unit
$\mathbf{B_{MSY}}$	the stock biomass expected to exist under equilibrium conditions when fishing at F_{MSY}
$\mathbf{B_{OY}}$	the stock biomass expected to exist under equilibrium conditions when fishing at F_{OY}
$\mathbf{B_{CURR}}$	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
$\mathbf{F_{30\%SPR}}$	fishing mortality that will produce a static SPR = 30%
$\mathbf{F_{CURR}}$	the current instantaneous rate of fishing mortality
$\mathbf{F_{MSY}}$	the rate of fishing mortality expected to achieve MSY under equilibrium conditions and a corresponding biomass of B_{MSY}
$\mathbf{F_{OY}}$	the rate of fishing mortality expected to achieve OY under equilibrium conditions and a corresponding biomass of B_{OY}
FEIS	final environmental impact statement
FMP	fishery management plan
FMU	fishery management unit
M	natural mortality rate
MARMAP	Marine Resources Monitoring Assessment and Prediction Program
MFMT	maximum fishing mortality threshold
MMPA	Marine Mammal Protection Act
MRFSS	Marine Recreational Fisheries Statistics Survey
MRIP	Marine Recreational Information Program
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MSST	minimum stock size threshold
MSY	maximum sustainable yield
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OFL	overfishing limit
OY	optimum yield
RIR	regulatory impact review
SAMFC	South Atlantic Fishery Management Council
SEDAR	Southeast Data, Assessment, and Review
SEFSC	Southeast Fisheries Science Center
SERO	Southeast Regional Office
SIA	social impact assessment
SPR	spawning potential ratio
SSC	Scientific and Statistical Committee

Regulatory Amendment 15 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region

Documents:	Regulatory Amendment 15 Environmental Assessment Regulatory Impact Review Regulatory Flexibility Act Analysis
Proposed actions:	This amendment considers: adjustments to the optimum yield and annual catch limit for yellowtail snapper in the South Atlantic; modifications to the commercial and recreational fishing years for yellowtail snapper and establishment of a spawning season closure for the commercial sector; and modifications to the gag commercial annual catch limit and/or modification or removal of the accountability measure that requires a closure of all shallow water groupers (red grouper, black grouper, scamp, red hind, rock hind, yellowmouth grouper, yellowfin grouper, coney, and graysby) when the gag commercial annual catch limit is met or projected to be met.
Lead agency:	Regulatory Amendment 15 – South Atlantic Fishery Management Council EA/RIR/FIS – National Marine Fisheries Service (NMFS)
For Further Information Contact:	Robert K. Mahood South Atlantic Fishery Management Council 4055 Faber Place, Suite 201 North Charleston, SC 29405 843-571-4366 866-SAFMC-10 Robert.Mahood@safmc.net Phil Steele NMFS, Southeast Region 263 13th Avenue South St. Petersburg, FL 33701 727-824-5301 Phil.Steele@noaa.gov

Table of Contents

List of Appendices v
List of Figures vi
List of Tables vii
Summary 1
Chapter 1. Introduction 1
1.1 What Actions Are Being Proposed? 1
1.2 Who is Proposing the Actions? 1
1.3 Where is the Project Located? 2
1.4 Purpose and Need 3
1.5 Why are the South Atlantic Council and NMFS Considering Action? 3
1.6 What is the History of Management for the species considered in this amendment? 4
1.7 Acceptable Biological Catch (ABC) for Yellowtail Snapper 4
1.8 How is the South Atlantic Council Modifying the Overfishing Definition for Yellowtail Snapper? 6
1.9 What Are the Existing Accountability Measures? 8
Chapter 2. Proposed Actions and Alternatives 10
2.1 Action 1. Revise Annual Catch Limit (ACL) and Optimum Yield (OY) for Yellowtail Snapper 10
2.2.1 A Summary of the Effects of the Alternatives 11
2.2 Action 2. Yellowtail Snapper: Commercial and Recreational Fishing Year and Commercial Spawning Season Closure 13
2.2.2 A Summary of the Effects of the Alternatives 13
2.3 Action 3. Gag and Shallow Water Groupers: Commercial Annual Catch Limit and Accountability Measures 15
2.2.3 A Summary of the Effects of the Alternatives 16
Chapter 3. Affected Environment 18
3.1 Habitat Environment 19
3.1.1 Essential Fish Habitat 19
3.1.2 Habitat Areas of Particular Concern 20
3.2 Biological and Ecological Environment 21
3.2.1 Fish Populations 21
3.2.2 Other Species Affected 29
3.2.3 The Stock Assessment Process 30
3.2.4 Protected Species 30
3.3 Socio-economic Environment 31
3.3.1 Economic Environment 31
3.3.1.1 Economic Description of the Commercial Sector 31
3.3.1.2 Economic Description of the Recreational Sector 49
3.3.2 Social Environment 56
3.3.3 Environmental Justice 63
3.4 Administrative Environment 64
3.4.1 The Fishery Management Process and Applicable Laws 64
3.4.1.1 Federal Fishery Management 64

3.4.1.2 State Fishery Management 64
3.4.1.3 Enforcement 65
Chapter 4. Environmental Consequences and Comparison of Alternatives 67
4.1 Action 1. Revise Annual Catch Limit (ACL) and Optimum Yield (OY) for Yellowtail Snapper 67
4.1.1 Biological Effects 67
4.1.2 Economic Effects 68
4.1.3 Social Effects 70
4.1.4 Administrative Effects 71
4.2 Action 2. Yellowtail Snapper: Commercial and Recreational Fishing Year and Commercial Spawning Season Closure 71
4.2.1 Biological Effects 71
4.2.2 Economic Effects 75
4.2.3 Social Effects 78
4.2.4 Administrative Effects 78
4.3 Action 3. Gag and Shallow Water Groupers: Commercial Annual Catch Limit and Accountability Measures 79
4.3.1 Biological Effects 79
4.3.2 Economic Effects 90
4.3.3 Social Effects 91
4.3.4 Administrative Effects 92
Chapter 5. Reasoning for Council's Choice of Preferred Alternatives 93
5.1 Action 1. Revise Annual Catch Limit (ACL) and Optimum Yield (OY) for Yellowtail Snapper 93
5.2 Action 2. Yellowtail Snapper: Commercial and Recreational Fishing Year and Commercial Spawning Season Closure 94
5.3 Action 3. Gag and Shallow Water Groupers: Commercial Annual Catch Limit and Accountability Measures 96
Chapter 6. Cumulative Effects 98
6.1 Biological 99
6.2 Socioeconomic 112
Chapter 7. List of Preparers 113
Chapter 8. Agencies and Persons Consulted 115
Chapter 9. References 116

List of Appendices

Appendix A. Glossary

Appendix B. Essential Fish Habitat and Move to Ecosystem-based Management

Appendix C. Other Applicable Law

Appendix D. History of Management

Appendix E. South Atlantic Gag Dead Discard Analysis for Regulatory Amendment 15

Appendix F. Gag and other shallow water grouper landings off North Carolina, 2008-2012.

Appendix G. Bycatch Practicability Analysis (BPA)

Appendix H. Regulatory Impact Review (economic analysis of preferred alternatives)

Appendix I. Regulatory Flexibility Act Analysis (economic analysis of proposed regulations)

List of Figures

Figure S-1. Mean discard rate (# fish/hook hour) for gag from commercial discard logbook data. 11
Figure 1.3.1. Jurisdictional boundaries of the South Atlantic Fishery Management Council. 2
Figure 3.1.1. Two components of the biological environment described in this document. .21
Figure 3.2.1. Total biomass of yellowtail snapper in metric tons. 24
Figure 3.2.2. Annual recruitment of yellowtail snapper expressed as biomass of age 1 fish in metric tons. 25
Figure 3.3.1. Snapper grouper class 1 (unlimited) and class 2 (225-Pound trip limit) permits 2005-2011....56
Figure 3.3.2. Snapper grouper class 1 (unlimited) permit frequency by homeport. 57
Figure 3.3.3. Snapper grouper class 2 (225-Pound trip limit) permits frequency by homeport....57
Figure 3.3.4. South Atlantic communities ranked by regional quotient of weight and value of yellowtail snapper landings 58
Figure 3.3.5. Commercial fishing engagement and reliance for top yellowtail snapper fishing communities 59
Figure 3.3.6. Recreational fishing engagement and reliance for top yellowtail snapper fishing communities 60
Figure 3.3.7. Social vulnerability indices for top yellowtail snapper fishing communities....61
Figure 3.3.8. South Atlantic communities ranked by regional quotient of weight and value of shallow water grouper landings 61
Figure 3.3.9. Commercial fishing engagement and reliance for top shallow water grouper fishing communities 62
Figure 3.3.10. Social vulnerability indices for top shallow water grouper fishing communities 62
Figure 4.2.1. Average commercial landings of yellowtail snapper in the South Atlantic by month from 2006 through 2011. 72
Figure 4.2.2. Average recreational landings of yellowtail snapper in the South Atlantic by month from 2006 through 2011. 74
Figure 4.3.1. Hierarchical cluster analysis of species presence-absence in the snapper grouper commercial vertical line landings aggregated by year, month, area, and depth. 84
Figure 4.3.2. Mean discard rate (# fish/hook hour) for gag from commercial discard logbook data. 85
Figure 4.3.3. Number of red grouper per trip relative to the number of gag per trip on trips taken between May and August 2003 off North Carolina. 86

List of Tables

Table S-1. Commercial and recreational landings (lbs ww) of yellowtail snapper relative to ACLs for 2012 and 2013. 4
Table S-2. Changes in Gross Revenue and Consumer Surplus under the Alternatives for Action 1. 5
Table S-3. Economic Effects of sub-alternatives under **Alternative 4** for **Action 2**. 7
Table S-4. Commercial and recreational landings (lbs gw) of gag relative to quota/ACLs for 2009-2012....10
Table 2.1.1. Commercial and recreational landings (lbs ww) of yellowtail snapper relative to ACLs for 2012 and 2013. 11
Table 2.1.2. Changes in Gross Revenue and Consumer Surplus under the Alternatives for **Action 1**....12
Table 2.2.1. Economic Effects of sub-alternatives under **Alternative 4** for **Action 2**....14
Table 2.3.1. Commercial and recreational landings (lbs gw) of gag relative to quota/ACLs for 2009-2012. 16
Table 3.2.1. Management parameters from the 2012 benchmark assessment for yellowtail snapper. Values are given for maximum sustainable yield (MSY), the fishing mortality at MSY (F_{MSY}), the fishing mortality from the terminal year of the assessment (F_{2010}), spawning stock biomass at MSY (SSB_{MSY}), the minimum stock size threshold (MSST), and the spawning stock biomass from the terminal year of the assessment (SSB_{2010})..24
Table 3.3.1. Landings, Gross Revenue, Trips, Vessels, and Dealers by Year on South Atlantic Yellowtail Snapper Trips, 2007-2011. 37
Table 3.3.2. Landings and Revenue Statistics by Year for Vessels Harvesting Yellowtail Snapper from 2007-2011. 37
Table 3.3.3. Average South Atlantic Yellowtail Snapper Landings, Gross Revenue, Price, and Trips by Month for Trips Harvesting South Atlantic Yellowtail Snapper, 2007-2011. 38
Table 3.3.4. Landings, Gross Revenue, Trips, Vessels, and Dealers by Year on South Atlantic Shallow Water Grouper (SWG) Trips, 2007-2011. 46
Table 3.3.5. Landings, Gross Revenue, Trips, Vessels, and Dealers by Year on South Atlantic Gag Trips, 2007-2011. 46
Table 3.3.6. Landings and Revenue of South Atlantic Deep Water Grouper (DWG), 2007-2011. 47
Table 3.3.7. Landings and Revenue Statistics for Vessels Harvesting South Atlantic SWG in 2011. 47
Table 3.3.8. Landings and Revenue Statistics for Vessels Harvesting South Atlantic Gag in 2011. 47
Table 3.3.9. Landings (pounds whole weight) of yellowtail snapper in the South Atlantic by mode, 2007-2011. 50
Table 3.3.10. Average landings (pounds whole weight) of yellowtail snapper in the South Atlantic, by wave, 2007-2011....50
Table 3.3.11. Catch trips for yellowtail snapper in the South Atlantic, by mode, 2007-2011. 52

Table 3.3.12. Target trips for yellowtail snapper in the South Atlantic, by mode, 2007-2011. 52
Table 3.3.13. Average catch and target trips for yellowtail snapper in the South Atlantic, by wave, 2007-2011. 52
Table 3.3.14. Summary of yellowtail snapper target trips (2007-2011) and associated economic impacts (2008 dollars).....55
Table 4.1.1. Changes in Gross Revenue and Consumer Surplus under the Alternatives for **Action 1**.....70
Table 4.2.1. Average monthly commercial landings (pounds whole weight) for yellowtail snapper for the period 2006-2011.....73
Table 4.2.2. Economic Effects of sub-alternatives under **Alternative 4** for **Action 2**.....76
Table 4.3.1. Commercial and recreational ACLs for snapper grouper species. 81
Table 4.3.2. South Atlantic commercial trips from 2009 to 2011 that landed at least one pound of gag between October 21 and December 31. 87
Table 4.3.3. South Atlantic commercial trips for 2011 that landed at least one pound of red grouper between October 21 and December 31. 87
Table 4.3.4. Annual landings of gag grouper and red grouper on gag "target" trips off North Carolina from 2008 through 2011. 88
Table 4.3.5. Annual landings of gag and red grouper on red grouper "target" trips off North Carolina from 2008 through 2011. 88
Table 4.3.6. South Atlantic gag landings and estimated dead discards from October 21 to December 31, 2011, with gag target trips removed. 89
Table 6.1.1. The cause and effect relationship of fishing and regulatory actions within the time period of the Cumulative Effects Analysis (CEA). 107
Table 7.1.1. List of preparers of the document. 113
Table 7.1.2. List of interdisciplinary plan team members for the document.....114

Regulatory Amendment 15 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region

Summary

What Actions Are Being Proposed?

This amendment proposes actions to:

(1) modify the optimum yield (OY) and annual catch limit (ACL) for yellowtail snapper in the South Atlantic;

(2) modify to the commercial and recreational yellowtail snapper fishing years and a spawning season closure for the commercial sector; and

(3) modify the gag ACL and/or modify or remove the accountability measure (AM) that requires a closure of shallow-water groupers (red grouper, black grouper, scamp, yellowmouth grouper, yellowfin grouper, red hind, rock hind, graysby, and coney) when the commercial ACL for gag is met or projected to be met.

Why are the South Atlantic Council and NMFS Considering Action?

The South Atlantic Fishery Management Council (South Atlantic Council) and the National Marine Fisheries Service (NMFS) are considering taking action to adjust the OY and ACL for yellowtail snapper in response to the new stock assessment. The yellowtail snapper stock was completed in May 2012 with data through 2010 (FWRI 2012). In response to the new assessment NMFS issued a temporary rule on November 7, 2012, as requested by the South Atlantic Council, to increase the commercial ACL for yellowtail snapper thereby avoiding an in-season closure for the species (77 FR 66744). NMFS increased the commercial ACL from 1,142,589 lbs ww to 1,596,510 lbs ww. This temporary rule is effective for 180 days, unless superseded by subsequent rulemaking, although NMFS may extend the rule's effectiveness for an additional 186 days. The intent of Regulatory Amendment 15 is to specify ACLs for yellowtail snapper before the temporary rule expires, which would remain in effect each year until modified.

A change in the yellowtail snapper commercial fishing year is being considered to diminish the possibility of a commercial closure and lengthen the commercial fishing season. Changes to the recreational fishing year could be made to be consistent with any changes to the commercial fishing year and avert administrative issues. A spawning season closure is being considered to provide protection to yellowtail snapper during a vulnerable time when spawning aggregations tend to occur.

Action to modify the existing gag ACL and modify/or remove the AM that requires a closure of all shallow-water groupers when the gag ACL is met or projected to be met is being considered to minimize socioeconomic impacts to those who utilize this portion of the snapper grouper fishery in the South Atlantic region.

Action 1. Revise Annual Catch Limit (ACL) and Optimum Yield (OY) for Yellowtail Snapper

Alternative 1 (No Action). For yellowtail snapper, retain ACL = OY = ABC based on results from SEDAR 3 (2003).

South Atlantic ACL = 3,037,500
Commercial ACL = 1,142,589
Recreational ACL = 1,031,286
Recreational ACT = 897,160
(all values pounds (lbs) whole weight (ww) and landings only)

Note: These values are based upon the results of SEDAR 3 (2003); an acceptable biological catch (ABC) per the Scientific and Statistical Committee's (SSC) recommendation and ABC Control Rule of 2,898,500 lbs ww; jurisdictional allocations of South Atlantic = 75% of ABC and Gulf of Mexico = 25% of ABC [South Atlantic ABC = 2,173,875 lbs ww (GOM = 724,625 lbs ww)]; sector allocations of commercial = 52.56% and recreational = 47.44%; and a recreational sector ACT definition of ACL*(1-PSE) or ACL*0.5, whichever is greater, whereas the average percent standard error (PSE) for MRFSS for yellowtail snapper during 2005-2009 is 13%. The PSE, or Proportional Standard Error, is a measure of precision. For more information on PSE, refer to http://www.st.nmfs.noaa.gov/st1/recreational/queries/caveat.html

Effective November 7, 2012, a temporary rule through emergency action increased the yellowtail snapper commercial ACL from 1,142,589 lbs ww to 1,596,510 lbs ww. The rule is effective for 180 days, and can be extended for an additional 186 days.

Preferred Alternative 2. For yellowtail snapper, set ACL = OY = ABC based on results from new stock assessment (FWRI 2012).

Commercial ACL = 1,596,510
Recreational ACL = 1,440,990
Recreational ACT = 1,253,661
(all values pounds whole weight and landings only)

Alternative 3. For yellowtail snapper, set ACL = OY = 90% of the ABC based on results from new stock assessment (FWRI 2012).

South Atlantic ACL following 10% buffer = 2,733,750
Commercial ACL = 1,436,859
Recreational ACL = 1,296,891
Recreational ACT = 1,128,295
(all values pounds whole weight and landings only)

Alternative 4. For yellowtail snapper, set ACL = OY = 80% of the ABC based on results from new stock assessment (FWRI 2012).

South Atlantic ACL following 20% buffer = 2,430,000
Commercial ACL = 1,277,208

Recreational ACL = 1,152,792
Recreational ACT = 1,002,929
(all values pounds whole weight and landings only)

Note: The values under **Alternatives 2 (Preferred)-4** are based upon the results of the 2012 Stock Assessment Report for Yellowtail Snapper in the South Atlantic and Gulf of Mexico (FWRI 2012); an ABC per the SSC recommendation and ABC Control Rule of 4,050,000 lbs ww; jurisdictional allocations of South Atlantic = 75% of ABC and Gulf of Mexico = 25% of ABC (South Atlantic ABC = 3,037,500 lbs ww and Gulf of Mexico ABC = 1,012,500 lbs ww); sector allocations of commercial = 52.56% and recreational = 47.44%; and a recreational sector ACT definition of ACL*(1-PSE) or ACL*0.5, whichever is greater, whereas the average percent standard error for Marine Recreational Fisheries Statistical Survey for yellowtail snapper during 2005-2009 is 13%.

The intent is for the ACLs specified in this amendment to become effective during the 2013 fishing year and remain in effect each year until modified. Landings relating to ACLs are shown in **Table S-1**.

Table S-1. Commercial and recreational landings (lbs ww) of yellowtail snapper relative to ACLs for 2012 and 2013.

Year	Commercial Quota/ACL	Commercial Landings	Commercial Over/Under	Commercial % Over/Under	Recreational Quota/ACL	Recreational Landings	Recreational Over/Under	Recreational % Over/Under
2012	1,142,589	N/A	N/A	N/A	1,031,286	N/A	N/A	N/A
(emerg)	1,596,510	1,351,497	Under	85%	1,440,990	291,655	Under	28%
2013	1,596,510	32,594	N/A	N/A	N/A	N/A	N/A	N/A

Source: Marine Recreational Information Program and Southeast Fisheries Science Center Commercial Landings System
Note: Recreational landings are incomplete for 2012.

On November 7, 2012, NMFS issued a temporary rule to increase the commercial ACL for yellowtail snapper, as requested by the South Atlantic Council, thereby avoiding an in-season closure for the species (77 FR 66744). NMFS increased the commercial ACL from 1,142,589 lbs ww to 1,596,510 lbs ww. This temporary rule is effective for 180 days, unless superseded by subsequent rulemaking, although NMFS may extend the rule's effectiveness for an additional 186 days. The intent for Regulatory Amendment 15 is to specify ACLs for yellowtail snapper before the temporary rule expires, which would remain in effect each year until modified.

Summary of Effects

Biological

Alternative 1 (No Action), in the absence of an adjustment to the commercial ACL, would result in the greatest biological benefit to the yellowtail snapper stock in the South Atlantic. However, harvest levels would be significantly below the level that the latest stock assessment (FWRI 2012) indicates can be harvested sustainably. Hence, **Alternative 1 (No Action)** would not achieve OY and therefore be

contrary to the mandates of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). **Alternatives 3** and **4** would have a greater positive biological effect than **Preferred Alternative 2** because they would create a buffer between the ACL/OY and the ABC, with **Alternative 4** setting the most conservative ACL at 80% of the ABC. Creating a buffer between the ACL/OY and ABC would provide greater assurance that overfishing is prevented, and the long-term average biomass is near or above B_{MSY}. The South Atlantic Council's and Gulf of Mexico Fishery Management Council's SSCs recommended an ABC based on a 40% probability of overfishing (P*=0.4) for yellowtail snapper; therefore, a buffer has been established between the overfishing limit and the ABC, which accounts for scientific uncertainty.

Economic

Preferred Alternative 2 would be expected to generate the greatest economic benefits relative to **Alternative 1 (No Action),** followed by **Alternative 3** and **Alternative 4**, in terms of potential increases in gross revenue and consumer surplus to the commercial and recreational sectors, respectively (**Table S-2**). **Preferred Alternative 2** would establish the same ACLs implemented under the current temporary rule.

Table S-2. Changes in Gross Revenue and Consumer Surplus under the Alternatives for Action 1.
**Note that ACLs are in gutted weight (lbs gw).

Alternative	Commercial ACL (lbs gw)	Yellowtail Snapper Gross Revenue	Recreational ACL (lbs ww)	Yellowtail Snapper Consumer Surplus
1	1,029,421	$3,263,265	1,031,286	$11,776,510
2 (Preferred)	**1,438,297**	**$4,559,401**	**1,440,990**	**$16,456,106**
3	1,294,468	$4,103,464	1,296,891	$14,810,495
4	1,150,638	$3,647,523	1,152,792	$13,164,885

Social

The overall social effects of increased harvest, as proposed under **Alternative 2 (Preferred)**, **Alternative 3,** and **Alternative 4** should be positive, with **Preferred Alternative 2** resulting in the most beneficial social impacts among the alternatives. Allowing for continued harvest would provide revenues without changing fishing behaviors or patterns that should translate into positive social effects, in contrast to early closure, as could occur under **Alternative 1 (No Action)**, that could impose unnecessary hardships to individuals, businesses, and their communities. Those negative social effects would likely affect communities where social vulnerabilities are the highest; however, the negative social effects would also be tied to a particular community's dependency on commercial fishing and yellowtail snapper.

Action 2. Yellowtail Snapper: Commercial and Recreational Fishing Year and Commercial Spawning Season Closure

Preferred Alternative 1 (No Action). Retain the calendar year as the commercial and recreational fishing year for yellowtail snapper. Do not establish a spawning season closure for the commercial sector for yellowtail snapper.

Alternative 2. Modify the commercial fishing year for yellowtail snapper.

Sub-alternative 2a. Commercial fishing year begins on June 1 and ends on May 31.
Sub-alternative 2b. Commercial fishing year begins on July 1 and ends on June 30.
Sub-alternative 2c. Commercial fishing year begins on August 1 and ends on July 31.
Sub-alternative 2d. Commercial fishing year begins on September 1 and ends on August 31.

Alternative 3. Modify the recreational fishing year for yellowtail snapper.

Sub-alternative 3a. Recreational fishing year begins on June 1 and ends on May 31.
Sub-alternative 3b. Recreational fishing year begins on July 1 and ends on June 30.
Sub-alternative 3c. Recreational fishing year begins on August 1 and ends on July 31.
Sub-alternative 3d. Recreational fishing year begins on September 1 and ends on August 31.

Alternative 4. Establish a yellowtail snapper spawning season closure for the commercial sector.

Sub-alternative 4a. Prohibit commercial harvest of yellowtail snapper annually from April 1 to June 30.
Sub-alternative 4b. Prohibit commercial harvest of yellowtail snapper annually from June 1 to August 31.
Sub-alternative 4c. Prohibit commercial harvest of yellowtail snapper annually from April 1 to May 31.
Sub-alternative 4d. Prohibit commercial harvest of yellowtail snapper annually from June 1 to July 31.

Summary of Effects

Biological

Assuming implementation of the new commercial ACL as proposed under Action 1, it is likely that harvest of yellowtail snapper would not close during the fishing year and there would be no biological effects from a change in the fishing year. If, on the other hand, a closure is implemented during the fishing year due to the ACL being met, then the start of the fishing year could be adjusted to increase the probability that the closed months would occur during the spawning period. Under the latter scenario, a fishing year start of August 1, as **Sub-alternatives 2c** and **3c** propose, would be biologically advantageous because the closed months are more likely to coincide with the yellowtail snapper

spawning season (April to August). Similarly, **Sub-alternatives 2d** and **3d**, which would change the start date of the fishing year to September 1, could be biologically beneficial but the biological effects would be greater for **Sub-alternatives 2c** and **3c**. **Sub-alternatives 2a**, **2b, 3a,** and **3b** could result in positive biological impacts if closures occurred during the beginning of peak spawning for yellowtail snapper; however, biological benefits for other sub-alternatives would likely be greater. An indirect biological benefit would result from **Preferred Alternative 1 (No Action)** in that the fishing year of yellowtail snapper for future stock assessments would be consistent with previous ones. Of the four sub-alternatives that consider a spawning season closure for the commercial sector, **Sub-alternatives 4a** and **4b** would provide a longer hiatus in fishing activity and therefore result in greater biological benefits than **Sub-alternatives 4c** and **4d**.

Because yellowtail snapper in South Florida spawn mainly from April through August, a fishing year that starts after August, as proposed under **Sub-alternatives 2d** and **3d**, would likely add the most protection to the stock if both the commercial and recreational sectors close prior to the end of the fishing year. The earlier the closure, the greater the biological benefits. **Sub-alternatives 2c** and **3c** would provide the next best level of protection under the same circumstances.

Economic

Relative to **Preferred Alternative 1 (No Action)**, **Sub-alternative 4a** would produce the greatest reduction in gross revenue under either of the scenarios, followed by **Sub-alternative 4b**, **Sub-alternative 4c**, and **Sub-alternative 4d (Table S-3)**. The reduction in gross revenue of concurrently harvested non-yellowtail snapper species is the inverse order, with the greatest reduction occurring under **Sub-alternative 4d**, followed by **Sub-alternative 4b**, **Sub-alternative 4c**, and **Sub-alternative 4a**. Most importantly, the reduction in total gross revenue would be greatest under **Sub-alternative 4a**, followed by **Sub-alternative 4b**, **Sub-alternative 4c**, and **Sub-alternative 4d** under any of the scenarios.

Table S-3. Economic Effects of sub-alternatives under **Alternative 4** for **Action 2**.

	Sub-alt. 4a	**Sub-alt. 4b**	**Sub-alt. 4c**	**Sub-alt. 4d**
Percentage of 2007-2011 yellowtail landings	38%	32%	24%	23%
Percentage of 2007-2011 other species landings	23%	30%	28%	32%
Reductions assuming 2007-2011 average landings				
Reduction in yellowtail gross revenue	$1,075,303	$897,966	$687,027	$641,746
Reduction in non-yellowtail gross revenue	$211,953	$275,382	$251,953	$291,846
Reduction in total gross revenue	$1,287,256	$1,173,348	$938,980	$933,592
Reductions assuming ACL is fully targeted*				
Reduction in yellowtail gross revenue	$1,917,825	$1,601,540	$1,225,326	$1,144,567

*This refers to losses comparing the ACL to landings in months closed without any effort shift.

Social

Sub-alternatives 4a and **4b** would close the commercial sector over the longest period of time and occur during the time of the year when peak commercial harvest has occurred. These sub-alternatives would likely have the largest negative social effects and change fishing patterns the most. **Sub-alternatives 4c** or **4d** would also result in closing of the commercial sector during peak commercial harvesting but for a shorter period of time and, therefore, would have fewer negative social impacts than **Sub-alternatives 4a** and **4b**. Furthermore, since yellowtail snapper are harvested in the Gulf of Mexico and South Atlantic, changing the fishing year could create confusion for fishermen in south Florida and possibly have negative social effects if one side of the Florida Keys is open to harvest of yellowtail snapper and the other is closed.

Action 3. Gag and Shallow Water Groupers: Commercial Annual Catch Limit and Accountability Measures

Alternative 1 (No Action). Retain the gag ACL and the following three commercial AMs:
(1) If gag commercial landings, as estimated by the Science and Research Director (SRD), reach or are projected to reach the quota, the Assistant Administrator for Fisheries (AA) will file a notification with the Office of the Federal Register to close the commercial fishery for gag and all other South Atlantic shallow water grouper (SASWG) for the remainder of the fishing year. SASWG includes gag, black grouper, red grouper, scamp, red hind, rock hind, yellowmouth grouper, yellowfin grouper, graysby, and coney.

(2) Individual ACLs and AMs are in place for black grouper, red grouper, and scamp. If the ACLs are projected to be met, the species are closed in-season. For red grouper, reduce the ACL by overages the following year. For black grouper and scamp, reduce the ACL by overages the following year if overfished.

(3) If commercial landings for other SASWG (<u>including red hind, rock hind, yellowmouth grouper, yellowfin grouper, coney, and graysby)</u>, as estimated by the SRD, reach or are projected to reach the commercial ACL of 49,488 pounds (22,447 kg), round weight, the AA will file a notification with the Office of the Federal Register to close the commercial sector for this complex for the remainder of the fishing year. On and after the effective date of such a notification, all sale or purchase of other SASWG is prohibited, and harvest or possession of these species in or from the South Atlantic exclusive economic zone is limited to the bag and possession limit. This bag and possession limit applies in the South Atlantic on board a vessel for which a valid Federal charter vessel/headboat permit for South Atlantic snapper-grouper has been issued, without regard to where such species were harvested, i.e., in state or Federal waters. If commercial landings exceed the ACL, and at least one of the species in the other SASWG complex is overfished, based on the most recent status of U.S. Fisheries Report to Congress, the AA will file a notification with the Office of the Federal Register, at or near the beginning of the following fishing year to reduce the ACL for that following year by the amount of the overage in the prior fishing year.

The adjusted gag commercial ACL is 352,940 pounds gutted weight (gw).

Alternative 2. Change the (1) AM as listed under the **Alternative 1 (No Action)** to the following:
If gag commercial landings, as estimated by the SRD, reach or are projected to reach the ACL, the AA will file a notification with the Office of the Federal Register to close the commercial fishery for gag for the remainder of the fishing year. Retain (2) and (3) of the commercial AMs as stated under **Alternative 1 (No Action)**.

Preferred Alternative 3. Change the (1) AM as listed under the **Alternative 1 (No Action)** to the following:

If gag commercial landings, as estimated by the SRD, reach or are projected to reach the ACL, the AA will file a notification with the Office of the Federal Register to close the commercial fishery for gag for the remainder of the fishing year. Retain (2) and (3) of the commercial AMs as stated under the **Alternative 1 (No Action)**. Reduce the unadjusted gag commercial ACL from 353,940 pounds gw to 326,722 pounds gw to account for projected gag discard mortality from commercial trips that target co-occurring species (i.e., red grouper and scamp) following a projected gag closure.

NOTE: The current gag ACL was adjusted for post-quota bycatch mortality in accordance with analyses in Snapper Grouper Amendment 16 (Amendment 16, SAFMC 2009a). The unadjusted commercial gag ACL is 353,940 pounds gw. Landings in relation to ACLs are shown in **Table S-4**.

Table S-4. Commercial and recreational landings (lbs gw) of gag relative to quota/ACLs for 2009-2012.

Year	Commercial Quota/ACL	Commercial Landings	Commercial Over/Under	Commercial %Over/Under	Recreational Quota/ACL	Recreational Landings	Recreational Over/Under	Recreational %Over/Under
2009	352,940	248,024	104,916	83%	N/A	N/A	N/A	N/A
2010	352,940	235,272	117,668	72%	N/A	N/A	N/A	N/A
2011	352,940	426,667	80,005	121%	340,060	169,854	170,206	50%
2012	352,940	346,662	6,278	98%	340,060	111,695	228,365	33%

Source: Marine Recreational Information Program and Southeast Fisheries Science Center Commercial Landings System.
Note: Recreational landings are incomplete for 2012. Commercial AM was not triggered for gag in 2011 because the overage of ACL was not realized until the fishing year had ended. The commercial AM was triggered in 2012.

Summary of Effects

Biological

Amendment 16 to the Snapper Grouper FMP (Amendment 16) established a provision to prohibit harvest for all shallow water grouper species when the gag quota is met or is expected to be met (**Alternative 1 (No Action)**). The gag quota was never met prior to 2011; however, commercial gag discards have declined since implementation of Amendment 16 in 2009 (**Figure S-1;** see **Section 4.3.1** for an explanation of how the gag commercial discard rate was obtained).

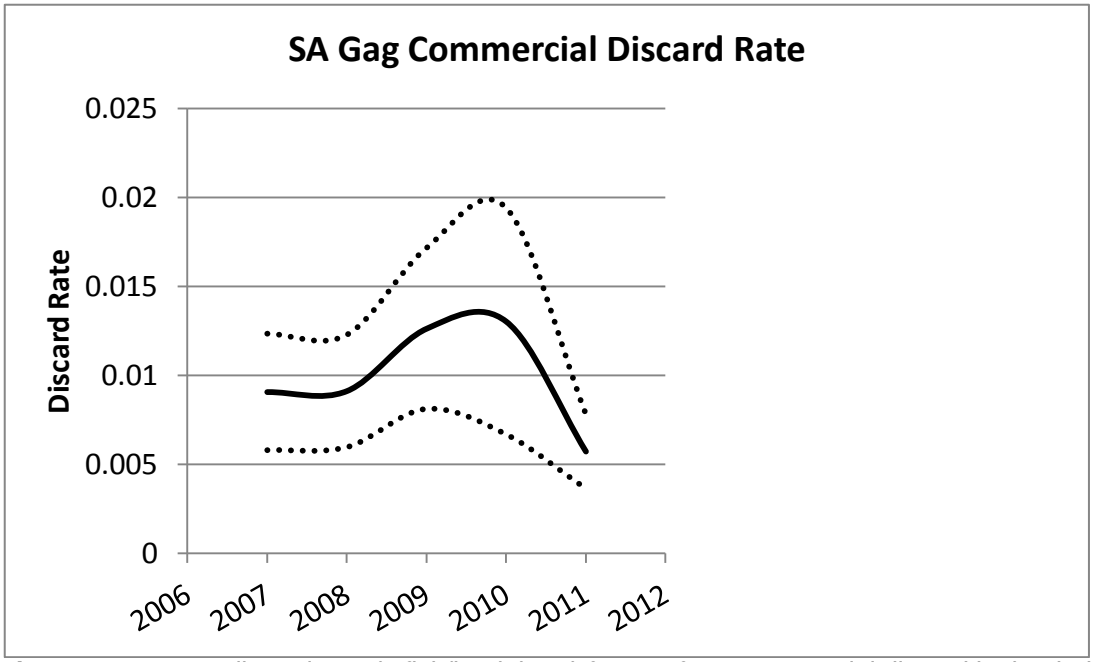

Figure S-1. Mean discard rate (# fish/hook hour) for gag from commercial discard logbook data. Source: NMFS SERO

In 2010 and 2011, the Reauthorized Magnuson-Stevens Act required implementation of ACLs and AMs for all managed species (with some statutory exceptions), which has resulted in the in-season prohibition of harvest of many snapper grouper species that are commonly caught together with gag (termed co-occurring species). The gag spawning season closure and in-season closures of species that co-occur with gag may be responsible for the decline in gag commercial discards. In general, the biological benefits of **Alternative 2** could be less than those of **Alternative 1 (No Action)**, but harvest of all species would continue to be dictated by the established ACLs and AMs, thus ensuring that overfishing does not occur. In terms of gag bycatch, **Alternative 2** would result in low negative biological impacts since recent studies suggest that with the exception of red grouper and scamp, gag are not as closely associated in the landings with the rest of the shallow water grouper species (**Figure 4.3.1**). **Preferred Alternative 3** proposes to further reduce the commercial ACL for gag to account for any discard mortality of gag that would result from targeting other shallow water groupers after gag is closed. **Preferred Alternative 3** would be expected to have a greater biological benefit for gag than **Alternative 1 (No Action)**, and similar biological effects as **Alternative 2**. **Alternatives 2** and **3 (Preferred)** would have a decreased biological effect for other shallow water grouper species since harvest could continue after the gag quota had been met. However, ACLs are in place for the other shallow water grouper species, which would ensure overfishing of these species did not occur and harvest was maintained at sustainable levels.

The reduction in the gag ACL was calculated by determining the pounds of gag lost from discard mortality if eliminated target trips still occurred but instead of targeting gag they fished for the other co-occurring shallow water groupers. The discard mortality rate of 40% was applied to the pounds of gag caught to estimate dead discards in pounds. Additionally, during development of Amendment 16 to the Snapper Grouper Fishery Management Plan the snapper grouper advisory panel and other fishermen

reported that their trips would be reduced by 20% after a gag quota closure as fishermen would shift to targeting other co-occurring shallow water groupers. To get an additional estimate of dead discards, target trips were decreased by 20% to estimate pounds of gag lost to discard mortality. Total dead discards in pounds were calculated by combining the pounds of gag lost to discard mortality from non-target trips with the pounds of gag lost to discard mortality from target trips switching to target other shallow water grouper. This analysis is described in detail in **Appendix E**.

Economic

The total loss in gross revenue under **Alternative 1 (No Action)** is estimated to be $1,239,950. This estimate is based on the total gross revenue from commercial trips targeting species in the South Atlantic Shallow Water Grouper (SASWG) complex between October 20 and December 31 (since the 2012 closure was implemented on October 20), and that from landings of gag from trips targeting species other than SASWG. The loss in gross revenue under **Alternative 2** is estimated to be $976,107 in absolute terms. However, relative to **Alternative 1 (No Action)**, **Alternative 2** would result in a gain of $263,843 in gross revenue. Under **Preferred Alternative 3**, the AM would be the same as under **Alternative 2**; however, the reduction in the ACL would partially offset that gain. Due to the unavailability of 2012 data, combined with the fact that the commercial ACL was exceeded in December of 2011, it is not possible to accurately predict how much earlier a closure would occur with a reduced commercial ACL of 326,722 pounds gutted weight (gw) under **Preferred Alternative 3**. Since the difference between the current and proposed ACL is 27,218 pounds (gw) and the average price per pound of gag in 2011 was $5.42, the loss in gross revenue due to the reduced ACL is estimated to be $142,102. The loss in gross revenue would be greater if the lower ACL causes the cancelation of trips targeting gag and the loss of all gross revenue from species harvested on those trips. Since the ACL would not be reduced under **Alternative 2**, the gain in gross revenue under **Alternative 2** would be $142,102 greater than under **Preferred Alternative 3** (i.e., the full $263,843). Thus, economic benefits are greatest under **Alternative 2**, followed by **Preferred Alternative 3**, and least under **Alternative 1 (No Action)**.

Social

In terms of social impacts, **Alternatives 2** and **3 (Preferred)** modify the AM to allow harvest of shallow water grouper when gag closes and should have social benefits, as the continued harvest of these species would provide important revenues and prevent changes in fishing patterns. The reduction in the gag commercial ACL as a result of anticipated discards coming from continued harvest of shallow water grouper, as proposed in **Preferred Alternative 3,** may have negative social effects on gag fishermen, but should provide more protection for the stock and therefore be positive in the long-term. **Preferred Alternative 3** would best minimize negative biological effects for gag while having positive social effects for those individuals who would want to target other shallow water grouper species after the gag quota is met.

Chapter 1. Introduction

1.1 What Actions Are Being Proposed?

This amendment proposes actions to: (1) modify the optimum yield (OY) and annual catch limit (ACL) for yellowtail snapper in the South Atlantic; (2) consider changes to the commercial and recreational yellowtail snapper fishing years and implementation of a spawning season closure for the commercial sector; and (3) modify the gag ACL and/or modify or remove the accountability measure (AM) that requires a closure of shallow water groupers (red grouper, black grouper, scamp, yellowmouth grouper, yellowfin grouper, red hind, rock hind, graysby, and coney) when the commercial ACL for gag is met or projected to be met.

South Atlantic Fishery Management Council

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

The South Atlantic Fishery Management Council (South Atlantic Council) is proposing the actions. The South Atlantic Council recommends management measures and submits them to the National Marine Fisheries Service (NMFS) who ultimately approves the final rule to implement the regulatory amendment on behalf of the Secretary of Commerce. NMFS is an agency in the National Oceanic and Atmospheric Administration within the Department of Commerce.

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 Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP, SAFMC 1983) (**Figure 1.3.1**). Yellowtail snapper and shallow water groupers are among the sixty species managed by the South Atlantic Council under the Snapper Grouper FMP.

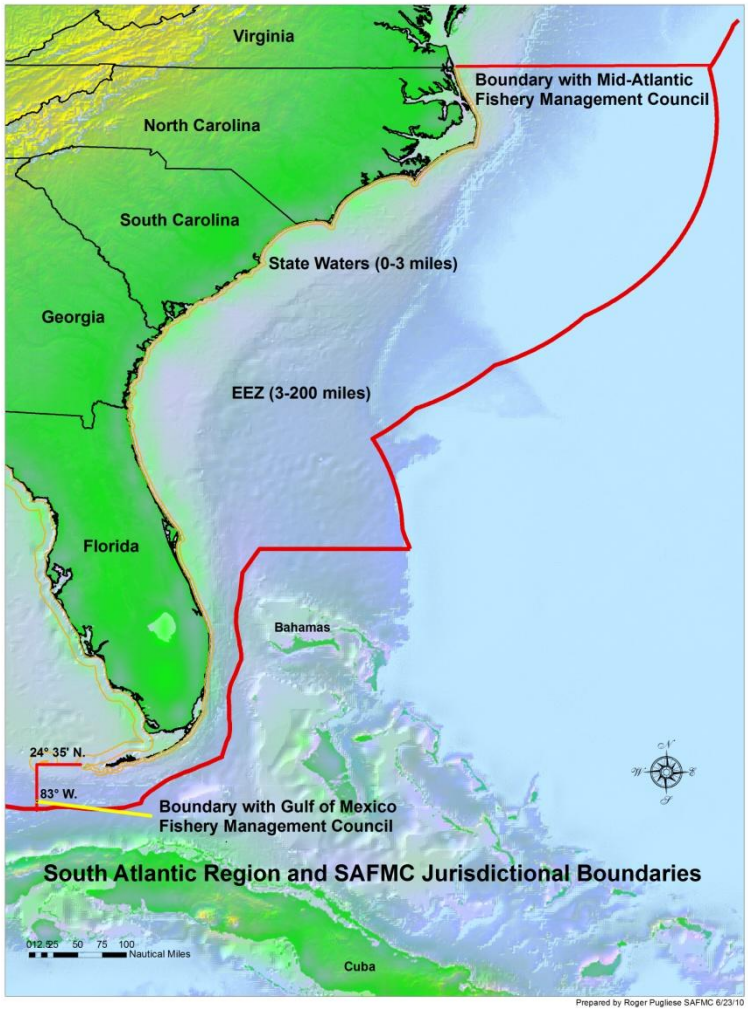

Figure 1.3.1. Jurisdictional boundaries of the South Atlantic Fishery Management Council.

1.4 Purpose and Need

Purpose for Actions

The purpose of the actions is to: Modify the existing specification of optimum yield and annual catch limit for yellowtail snapper in the South Atlantic; modify existing regulations for yellowtail snapper in the South Atlantic; and modify the existing gag commercial annual catch limit and/or accountability measure for gag that requires a closure of all other shallow water groupers (black grouper, red grouper, scamp, red hind, rock hind, graysby, coney, yellowmouth grouper, and yellowfin grouper) in the South Atlantic when the gag commercial annual catch limit is met or projected to be met.

Need for Actions

The need for actions is to: Ensure yellowtail snapper annual catch limits are based upon the best available science on stock status of this species in the southeast U.S; provide protection for the yellowtail snapper population during spawning periods; enhance socioeconomic benefits to fishermen and fishing communities that utilize the yellowtail snapper portion of the snapper grouper fishery; and reduce adverse socioeconomic effects to fishermen and fishing communities that utilize the shallow water grouper portion of the snapper grouper fishery.

1.5 Why are the South Atlantic Council and NMFS Considering Action?

The South Atlantic Council and NMFS are considering taking action to adjust the OY and ACL for yellowtail snapper in response to a new stock assessment. The yellowtail snapper stock was assessed in 2012 with data through 2010. In response to the new assessment NMFS issued a temporary rule on November 7, 2012, as requested by the South Atlantic Council, to increase the commercial ACL for yellowtail snapper thereby avoiding an in-season closure for the species (77 FR 66744). NMFS increased the commercial ACL from 1,142,589 lbs whole weight (ww) to 1,596,510 lbs ww. This temporary rule is effective for 180 days, unless superseded by subsequent rulemaking, although NMFS may extend the rule's effectiveness for an additional 186 days. The intent of Regulatory Amendment 15 is to specify ACLs for yellowtail snapper before the temporary rule expires, which would remain in effect each year until modified.

A change in the yellowtail snapper commercial fishing year is being considered to avoid in-season closures during peak harvest times (spring and early fall). Changes to the recreational fishing year would be made to be consistent with any changes to the commercial fishing year and avoid unnecessary administrative issues. Further, separate fishing years for the commercial and recreational sectors complicates stock assessments. The South Atlantic Council is considering a spawning season closure to provide protection to yellowtail snapper during a time when spawning aggregations occur and the species may be especially vulnerable to fishing gear.

Action to modify the existing gag ACL and modify/or remove an AM that requires a closure of all shallow water groupers when the gag ACL is met or projected to be met is being considered to minimize socioeconomic impacts to those who utilize this portion of the snapper grouper fishery in the South Atlantic region while maintaining biological protection for gag. The AM was implemented in 2009 through Snapper Grouper Amendment 16 (SAFMC 2009a) to reduce bycatch of gag. New information suggests the AM is not having the desired effect and greater protection for gag is being provided by measures implemented since 2009, particularly ACLs for species which co-occur with gag.

1.6 What is the History of Management for the species considered in this amendment?

Snapper grouper regulations in the South Atlantic where first implemented in 1983. See **Appendix D** of this document for a detailed history of management for the snapper grouper fishery.

1.7 Acceptable Biological Catch (ABC) for Yellowtail Snapper

Yellowtail snapper in the U.S. occur primarily in South Florida where they are managed as separate stocks by the South Atlantic Council and the Gulf of Mexico Fishery Management Council (Gulf Council). However, yellowtail snapper in the South Atlantic and Gulf of Mexico regions were assessed as one stock. The 2003 yellowtail snapper stock assessment (SEDAR 3 2003) used a release mortality estimate of 30%. The most recent assessment conducted by the Florida Fish and Wildlife Research Institute (FWRI) uses a lower bound for release mortality of 10% for the recreational sector, and 11.5% for the commercial sector, based on observer data (FWRI 2012). The 2012 stock assessment was conducted with a statistical catch-at-age model (ASAP2). Fishery-dependent data included commercial logbooks, recreational data from the Marine Recreational Fisheries Statistical Survey (MRFSS), and the headboat survey. Fishery-independent data are from the NMFS/University of Miami Reef Visual Census. Results from the assessment indicate that, as of 2010, the yellowtail snapper stock is neither overfished nor experiencing overfishing. At a joint meeting of the South Atlantic Council's Scientific and Statistical Committee (SSC) and the Gulf Council's (Gulf Council) SSC, the South Atlantic Council's SSC, acting individually, by consensus accepted the use of the maximum sustainable yield (MSY) as the overfishing limit (OFL) for yellowtail snapper. The South Atlantic and Gulf Council's SSCs jointly accepted the yellowtail snapper assessment as the best available scientific information and set OFL as the yield at the model derived estimate of F_{MSY}.

The ABC in the South Atlantic Council's ABC Control Rule, is the yield in a probability distribution function (PDF) corresponding to a given P* value. The FWRI assessment scientists prepared a PDF with an adjusted coefficient of variation (CV) of 0.30 to account for scientific uncertainty and provide a wider distribution and somewhat lower OFL and ABC for a given P*. The South Atlantic Council's SSC and Gulf Council's SSC individually discussed where to set P* since each has a different ABC control rule to apply. Under the South Atlantic ABC control rule, P* = 0.40. The ABC control rule spreadsheet producing this result is shown below.

South Atlantic Fishery Management Council - ABC Control Rule		
Yellowtail snapper - October 2012		
Dimension	**Tier**	**Penalty Score**
I. Assessment Information (10%)		
	1. Quantitative assessment provides estimates of exploitation and biomass; includes MSY-derived benchmarks (0%)	0%
	2. Reliable measures of exploitation or biomass; no MSY benchmarks, proxy reference points. (2.5%)	
	3. Relative measures of exploitation or biomass, absolute measures of status unavailable. Proxy reference points (5%)	
	4. Reliable catch history. (7.5%)	
	5. Scarce or unreliable catch records. (10%)	
II. Uncertainty Characterization (10%)		
	1. Complete. Key Determinant – uncertainty in both assessment inputs and environmental conditions are included (0%)	5%
	2. High. Key Determinant – reflects more than just uncertainty in future recruitment. (2.5%)	
	3. Medium. Uncertainties are addressed via statistical techniques and sensitivities, but full uncertainty is not carried forward in projections. (5%)	
	4. Low. Distributions of Fmsy and MSY are lacking. (7.5%)	
	5. None. Only single point estimates; no sensitivities or uncertainty evaluations. (10%)	
III. Stock Status (10%)		
	1. Neither overfished nor overfishing. Stock is at high biomass and low exploitation relative to benchmark values. (0%)	0%
	2. Neither overfished nor overfishing. Stock may be in close proximity to benchmark values. (2.5%)	
	3. Stock is either overfished or overfishing. (5%)	
	4. Stock is both overfished and overfishing. (7.5%)	
	5. Either status criterion is unknown. (10%)	
IV. Productivity and Susceptibility – Risk Analysis (10%)		
	1. Low risk. High productivity, low vulnerability, low susceptibility. (0%)	5%
	2. Medium risk. Moderate productivity, moderate vulnerability, moderate susceptibility. (5%)	
	3. High risk. Low productivity, high vulnerability, high susceptibility. (10%)	
	Penalty Score sum	-10%
	P* (50 - penalty score)	**40%**

The resulting P* values from the South Atlantic Council's and Gulf Council's ABC control rules were very similar, but the South Atlantic Council's value was slightly more conservative and did not require interpolation between the values in the table provided by FWRI. **At P* = 0.40 and based on equilibrium MSY, the ABC yield is 4.13 million pounds (mp) whole weight (ww) (landings plus dead discards).**

Estimates of yield and productivity for fish stocks are available as both equilibrium and static values. Equilibrium values represent the yield expected, on average, over a long period of time from a given management strategy. Examples are quantities such as the MSY and OY. Static values represent the yield that can be taken at any given point in time and may be more or less than the equilibrium values. Examples are the yield estimated by stock assessment projections and presented as the result of a particular exploitation rate applied at a particular time. The important quantities in determining both static or equilibrium yield from a population are the amount of fish in the population, usually presented in stock biomass (weight), and the fishing pressure or rate of removal, usually presented as a rate (i.e., fishing mortality rate or F).

The yellowtail snapper ABC is apportioned 75% to the South Atlantic and 25% to the Gulf of Mexico. **Therefore, the new ABCs *in landed catch* for each region are 3.0375 mp ww for the South Atlantic and 1.0125 mp ww for the Gulf of Mexico.**

The South Atlantic Council's and Gulf Council's SSCs jointly recommended that the new values of OFL and ABC be implemented immediately for yellowtail snapper in the South Atlantic and Gulf of Mexico.

The yellowtail snapper stock assessment (FWRI 2012) was conducted with data through 2010. Estimates of recreational landings for private and charter boats were obtained through the MRFSS. Beginning in 2013, however, recreational landings will be tracked through the recently implemented Marine Recreational Information Program (MRIP). To monitor yellowtail snapper recreational landings in 2013 and compare them to the recreational ACL specified in this amendment (based on MRFSS recreational estimates), NMFS will apply a calibration factor to recreational landings obtained through MRIP. Over the long-term, the yellowtail snapper stock assessment will be updated using MRIP-derived recreational landings and the ABC, ACLs and ACT will be adjusted accordingly.

1.8 How is the South Atlantic Council Modifying the Overfishing Definition for Yellowtail Snapper?

The 2009 National Standard 1 Guidelines provide a definition of overfishing that allows overfishing to be determined in two ways, by a fishing mortality rate or by a level of catch:

> § 600.310 (e)(2)(i)(B)
>
> *"Overfishing (to overfish) occurs whenever a stock or stock complex is subjected to a level of fishing mortality or annual total catch that jeopardizes the capacity of a stock or stock complex to produce maximum sustainable yield (MSY) on a continuing basis."*

The National Standard 1 Guidelines provide more detail about these two methods, and require that FMPs describe which method will be used to determine an overfishing status:

> § 600.310 (e)(2)(ii)(A)
>
> *Status Determination Criteria to determine overfishing status. Each fishery management plan (FMP) must describe which of the following two methods will be used for each stock or stock complex to determine an overfishing status.*
>
> *(1) Fishing mortality rate exceeds maximum fishing mortality threshold (MFMT). Exceeding the MFMT for a period of 1 year or more constitutes overfishing. The MFMT or reasonable proxy may be expressed either as a single number (a fishing mortality rate or F value), or as a function of spawning biomass or other measure of reproductive potential.*
>
> *(2) Catch exceeds the overfishing limit (OFL). Should the annual catch exceed the annual OFL for 1 year or more, the stock or stock complex is considered subject to overfishing.*

The OFL is defined as an annual level of catch that corresponds directly to the MFMT, and is the best estimate of the catch level above which overfishing is occurring.

Each of the two methods for determining overfishing has its benefits and drawbacks.

MFMT Method – Overfishing occurring if fishing mortality exceeds the MFMT

The MFMT method is a more direct way of comparing the fishing rate to the maximum allowed rate of fishing, and it is less sensitive to recent fluctuations in recruitment than the OFL method. The estimates of fishing mortality are based on the maximum annual fishing mortality at any age. However, fishing mortality rates cannot be directly measured. They must be calculated as part of a stock assessment or assessment update, thus fishing mortality rates are only available for years when assessments are conducted.

The current fishing mortality reported in a Southeast Data, Assessment, and Review (SEDAR) assessment has a lag of one or more years. The most recent data used in assessments are usually the year prior to the year in which the analysis is conducted, and sometimes two years prior. Therefore, use of the "current fishing mortality" rate from a SEDAR stock assessment may not reflect the true status of the stock in years following a stock assessment, particularly if actions are taken to constrain effort and harvest.

OFL Method – Overfishing occurring if annual landings exceed the OFL

The OFL method is based on catch levels that are more easily understood by the public than fishing mortality. Unlike fishing mortality rates, a determination can be made on an annual basis as soon as catch totals are available. However, the use of the OFL method might not be appropriate for stocks with highly variable recruitment that cannot be predicted and therefore incorporated into the forecast of stock condition on which the OFL is based.

Overfishing Definition for Yellowtail Snapper

Each of the two methods for determining overfishing has its benefits and drawbacks with MFMT being a better estimate of overfishing status in a year in which a stock is assessed and OFL a better estimate of overfishing status in years when a current estimate of fishing mortality is not available. Therefore, the South Atlantic Council proposes the use of both the MFMT and OFL as a metric to determine the overfishing status of yellowtail snapper.

For yellowtail snapper, overfishing will be determined on an annual basis by the MFMT and OFL method. The estimate of F_{MSY} (MFMT) for yellowtail snapper from the current stock assessment (FWRI 2012) and the recommendation from the Gulf and South Atlantic Councils' SSCs from an October 10, 2012 meeting (GMFMC 2012) is 0.240, while the corresponding OFL value is 4.51 mp ww (landed catch). This is the same approach being used for yellowtail snapper in the Gulf of Mexico. Note: Despite being managed as separate stock units with the boundary essentially being U.S. Highway 1 in the Florida Keys west to the Dry Tortugas, the southeastern U.S. yellowtail snapper is assessed as a single stock for assessment purposes; as such, single MFMT and OFL values have been provided by the assessment scientists. The Report to Congress on the Status of U.S. Fisheries lists one overfishing/overfished status for yellowtail snapper in the Gulf of Mexico and South Atlantic rather than for each in area separately.

If either the MFMT (during an assessment year) or the OFL method (during a non-assessment year) is exceeded, the stock will be considered to be undergoing overfishing. Two examples are shown below:

Example 1. As a stock assessment is not conducted in 2014, the South Atlantic Council does not receive an updated estimate of F_{MSY} (MFMT). The OFL (landings only) for 2014 for the entire range of the stock (Gulf of Mexico and South Atlantic Regions) is 4.51 mp whole weight and provides the basis for the overfishing definition. Total landings in 2014 are 4.25 mp whole weight and below the OFL (4.51 mp whole weight). Overfishing in 2014 is not occurring.

Example 2. A SEDAR assessment is completed in 2014 and changes the F_{MSY} value to 0.240. The current estimate of the fishing mortality, termed $F_{CURRENT}$, is 0.255. Landings in 2014 are 4.25 mp whole weight, below OFL. Even though landings are below OFL, $F_{CURRENT}$ is greater than MFMT. Overfishing in 2014 is occurring.

1.9 What Are the Existing Accountability Measures?

The AMs for the yellowtail snapper commercial and recreational sectors were initially established through the Comprehensive ACL Amendment (SAFMC 2011c). The 2012 temporary rule to increase the commercial ACL based on the latest stock assessment implemented a revised AM for that sector. The current AMs are reproduced below from the regulations at Section 622.49:

<u>Yellowtail Snapper</u>

Commercial sector

(A) If commercial landings for yellowtail snapper, as estimated by the SRD, reach or are projected to reach the commercial ACL of 1,596,510 lb (724,165 kg), round weight, the AA will file a notification with the Office of the Federal Register to close the commercial sector for the remainder of the fishing year. On and after the effective date of such a notification, all sale or purchase of yellowtail snapper is prohibited and harvest or possession of this species in or from the South Atlantic EEZ is limited to the bag and possession limit. This bag and possession limit applies in the South Atlantic on board a vessel for which a valid Federal commercial or charter vessel/headboat permit for South Atlantic snapper-grouper has been issued, without regard to where such species were harvested, i.e., in state or Federal waters.

(B) If commercial landings exceed the ACL, and yellowtail snapper is overfished, based on the most recent Status of U.S. Fisheries Report to Congress, the AA will file a notification with the Office of the Federal Register, at or near the beginning of the following fishing year to reduce the ACL for that following year by the amount of the overage in the prior fishing year.

Recreational Sector

If recreational landings for yellowtail snapper, as estimated by the SRD, exceed the recreational ACL of 1,031,286 lb (467,783 kg), round weight, then during the following fishing year, recreational landings will be monitored for a persistence in increased landings and, if necessary, the AA will file a notification with the Office of the Federal Register, to reduce the length of the following recreational fishing season by the amount necessary to ensure recreational landings do not exceed the recreational ACL in the following fishing year. However, the length of the recreational season will also not be reduced during the

following fishing year if the RA determines, using the best scientific information available, that a reduction in the length of the following fishing season is unnecessary.

Gag

Commercial sector

If commercial landings, as estimated by the SRD, reach or are projected to reach the quota specified in § 622.42(e)(7), the AA will file a notification with the Office of the Federal Register to close the commercial fishery for gag and all other SASWG for the remainder of the fishing year.

Recreational sector

(A) If recreational landings, as estimated by the SRD, reach or are projected to reach the recreational ACL of 340,060 lb (154,249 kg), gutted weight, and gag are overfished, based on the most recent Status of U.S. Fisheries Report to Congress, the AA will file a notification with the Office of the Federal Register to close the gag recreational fishery for the remainder of the fishing year. On and after the effective date of such notification, the bag and possession limit for gag in or from the South Atlantic EEZ is zero. This bag and possession limit also applies in the South Atlantic on board a vessel for which a valid Federal charter vessel/headboat permit for South Atlantic snapper-grouper has been issued, without regard to where such species were harvested, i.e., in state or Federal waters.

(B) Without regard to overfished status, if gag recreational landings exceed the ACL, the AA will file a notification with the Office of the Federal Register, at or near the beginning of the following fishing year, to reduce the ACL for that fishing year by the amount of the overage.

(C) Recreational landings will be evaluated relative to the ACL as follows. For 2010, only 2010 recreational landings will be compared to the ACL; in 2011, the average of 2010 and 2011 recreational landings will be compared to the ACL; and in 2012 and subsequent fishing years, the most recent 3-year running average recreational landings will be compared to the ACL.

Chapter 2. Proposed Actions and Alternatives

2.1 Action 1. Revise Annual Catch Limit (ACL) and Optimum Yield (OY) for Yellowtail Snapper

Alternative 1 (No Action). For yellowtail snapper, retain ACL = OY = ABC based on results from SEDAR 3 (2003).

Commercial ACL = 1,142,589
Recreational ACL = 1,031,286
Recreational ACT = 897,160
(all values pounds (lbs) whole weight (ww) and landings only)

Note: These values are based upon the results of SEDAR 3 (2003); an acceptable biological catch (ABC) from the Scientific and Statistical Committee's (SSC) recommendation and ABC Control Rule of 2,898,500 lbs ww; jurisdictional allocations of South Atlantic = 75% of ABC and Gulf of Mexico = 25% of ABC [South Atlantic ABC = 2,173,875 lbs ww (GOM = 724,625 lbs ww)]; sector allocations of commercial = 52.56% and recreational = 47.44%; and a recreational sector ACT definition of ACL*(1-PSE) or ACL*0.5, whichever is greater, whereas the average percent standard error for MRFSS for yellowtail snapper during 2005-2009 is 13%.

Effective November 7, 2012, a temporary rule through emergency action increased the yellowtail snapper commercial ACL from 1,142,589 lbs ww to 1,596,510 lbs ww. The rule is effective for 180 days, and can be extended for an additional 186 days.

Preferred Alternative 2. For yellowtail snapper, set ACL = OY = ABC based on results from new stock assessment (FWRI 2012).

South Atlantic ACL = 3,037,500
Commercial ACL = 1,596,510
Recreational ACL = 1,440,990
Recreational ACT = 1,253,661
(all values pounds whole weight and landings only)

Alternative 3. For yellowtail snapper, set ACL = OY = 90% of the ABC based on results from new stock assessment (FWRI 2012).

South Atlantic ACL following 10% buffer = 2,733,750
Commercial ACL = 1,436,859
Recreational ACL = 1,296,891
Recreational ACT = 1,128,295
(all values pounds whole weight and landings only)

Alternative 4. For yellowtail snapper, set ACL = OY = 80% of the ABC based on results from new stock assessment (FWRI 2012).

South Atlantic ACL following 20% buffer = 2,430,000
Commercial ACL = 1,277,208
Recreational ACL = 1,152,792
Recreational ACT = 1,002,929
(all values pounds whole weight and landings only)

Note: The values under **Alternatives 2 (Preferred)-4** are based upon the results of the 2012 Stock Assessment Report for Yellowtail Snapper in the South Atlantic and Gulf of Mexico (FWRI 2012); an ABC from the SSC recommendation and ABC Control Rule of 4,050,000 lbs ww; jurisdictional allocations of South Atlantic = 75% of ABC and Gulf of Mexico = 25% of ABC (South Atlantic ABC = 3,037,500 lbs ww and Gulf of Mexico ABC = 1,012,500 lbs ww); sector allocations of commercial = 52.56% and recreational = 47.44%; and a recreational sector ACT definition of ACL*(1-PSE) or ACL*0.5, whichever is greater, whereas the average percent standard error for MRFSS for yellowtail snapper during 2005-2009 is 13%.

The intent is for the ACLs specified in this amendment to become effective during the 2013 fishing year and remain in effect each year until modified. Landings relative to the ACLs are shown in **Table 2.1.1**.

Table 2.1.1. Commercial and recreational landings (lbs ww) of yellowtail snapper relative to ACLs for 2012 and 2013.

Year	Comm. Quota/ACL	Comm. Landings	Comm. Over/Under	Comm. %Over/Under	Rec. Quota/ACL	Rec. Landings	Rec. Over/Under	Rec. %Over/Under
2012	1,142,589	N/A	N/A	N/A	1,031,286	N/A	N/A	N/A
(emerg)	1,596,510	1,351,497	Under	85%	1,440,990	291,655	Under	28%
2013	1,596,510	32,594	N/A	N/A	N/A	N/A	N/A	N/A

Source: Marine Recreational Information Program and Southeast Fisheries Science Center Commercial Landings System.
Note: Recreational landings are incomplete for 2012.

On November 7, 2012, NMFS issued a temporary rule to increase the commercial ACL for yellowtail snapper, as requested by the South Atlantic Council, thereby avoiding an in-season closure for the species (77 FR 66744). NMFS increased the commercial ACL from 1,142,589 lbs ww to 1,596,510 lbs ww. This temporary rule is effective for 180 days, unless superseded by subsequent rulemaking, although NMFS may extend the rule's effectiveness for an additional 186 days. The intent of Regulatory Amendment 15 is to specify ACLs for yellowtail snapper before the temporary rule expires, which would remain in effect each year until modified.

2.2.1 A Summary of the Effects of the Alternatives

Alternative 1 (No Action), in the absence of an adjustment to the commercial ACL, would result in the greatest biological benefit to the yellowtail snapper stock in the South Atlantic. However, harvest levels would be below the level that the latest stock assessment (FWRI 2012) indicates can be harvested sustainably. Hence, **Alternative 1 (No Action)** would not achieve OY and therefore be contrary to the mandates of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). **Alternatives 3** and **4** would have a greater positive biological effect than **Preferred Alternative 2**

because they would create a buffer between the ACL/OY and the acceptable biological catch (ABC), with **Alternative 4** setting the most conservative ACL at 80% of the ABC. Creating a buffer between the ACL/OY and ABC would provide greater assurance that overfishing is prevented, and the long-term average biomass is near or above B_{MSY}. The South Atlantic Fishery Management Council's (South Atlantic Council) and Gulf of Mexico Fishery Management Council's (Gulf Council) SSCs recommended an ABC based on a 40% probability of overfishing (P*=0.4) for yellowtail snapper; therefore, a buffer has been established between the overfishing limit and the ABC, which accounts for scientific uncertainty.

The Comprehensive ACL Amendment (SAFMC 2011c) set OY equal to the ACL for yellowtail snapper. The long-term objective is to achieve OY through annual achievement of an ACL or ACT. OY would remain equal to the ACL under **Preferred Alternative 2** and **Alternatives 3** and **4**.

Preferred Alternative 2 would be expected to generate the greatest economic benefits relative to **Alternative 1 (No Action)**, followed by **Alternative 3** and **Alternative 4**, in terms of potential increases in gross revenue and consumer surplus to the commercial and recreational sectors, respectively **(Table 2.1.2)**. **Preferred Alternative 2** would establish the same commercial ACL implemented under the current temporary rule.

Table 2.1.2. Changes in Gross Revenue and Consumer Surplus under the Alternatives for **Action 1**. Note that ACLs are shown in gutted weight (gw).

Alternative	Commercial ACL (lbs gw)	Yellowtail Snapper Gross Revenue	Recreational ACL (lbs ww)	Yellowtail Snapper Consumer Surplus
1	1,029,421	$3,263,265	1,031,286	$11,776,510
2 (Preferred)	**1,438,297**	**$4,559,401**	**1,440,990**	**$16,456,106**
3	1,294,468	$4,103,464	1,296,891	$14,810,495
4	1,150,638	$3,647,523	1,152,792	$13,164,885

The overall social effects of increased harvest, as proposed under **Alternatives 2 (Preferred)**, **3** and **4** should be positive, with **Preferred Alternative 2** resulting in the most beneficial social impacts among the alternatives. Allowing for continued harvest would provide revenues without changing fishing behaviors or patterns that should translate into positive social effects, in contrast to early closure, as could occur under **Alternative 1 (No Action)**, that could impose unnecessary hardships to individuals, businesses, and their communities. Those negative social effects would likely affect communities where social vulnerabilities are the highest; however, the negative social effects would also be tied to a particular community's dependency on commercial fishing and yellowtail snapper.

Modifying the ACLs and OY for yellowtail snapper would not have direct impacts on the administrative environment.

2.2 Action 2. Yellowtail Snapper: Commercial and Recreational Fishing Year and Commercial Spawning Season Closure

Preferred Alternative 1 (No Action). Retain the calendar year as the commercial and recreational fishing year for yellowtail snapper. Do not establish a spawning season closure for the commercial sector for yellowtail snapper.

Alternative 2. Modify the commercial fishing year for yellowtail snapper.

Sub-alternative 2a. Commercial fishing year begins on June 1 and ends on May 31.
Sub-alternative 2b. Commercial fishing year begins on July 1 and ends on June 30.
Sub-alternative 2c. Commercial fishing year begins on August 1 and ends on July 31.
Sub-alternative 2d. Commercial fishing year begins on September 1 and ends on August 31.

Alternative 3. Modify the recreational fishing year for yellowtail snapper.

Sub-alternative 3a. Recreational fishing year begins on June 1 and ends on May 31.
Sub-alternative 3b. Recreational fishing year begins on July 1 and ends on June 30.
Sub-alternative 3c. Recreational fishing year begins on August 1 and ends on July 31.
Sub-alternative 3d. Recreational fishing year begins on September 1 and ends on August 31.

Alternative 4. Establish a yellowtail snapper spawning season closure for the commercial sector.

Sub-alternative 4a. Prohibit commercial harvest of yellowtail snapper annually from April 1 to June 30.
Sub-alternative 4b. Prohibit commercial harvest of yellowtail snapper annually from June 1 to August 31.
Sub-alternative 4c. Prohibit commercial harvest of yellowtail snapper annually from April 1 to May 31.
Sub-alternative 4d. Prohibit commercial harvest of yellowtail snapper annually from June 1 to July 31.

2.2.2 A Summary of the Effects of the Alternatives

Assuming implementation of the new commercial ACL as proposed under **Action 1**, it is likely that harvest of yellowtail snapper would not close during the fishing year and there would be no biological effects from a change in the fishing year. If, on the other hand, a closure is implemented during the fishing year due to the ACL being met, then the start of the fishing year could be adjusted to increase the probability that the closed months would occur during the spawning period. Under the latter scenario, a fishing year start of August 1, as **Sub-alternatives 2c** and **3c** propose, would be biologically advantageous because the closed months are more likely to coincide with the yellowtail snapper spawning season (April to August). Similarly, **Sub-alternatives 2d** and **3d**, which would change the start date of the fishing year to September 1, could be biologically beneficial with the biological effects being greater for **Sub-alternatives 2d** and **3d** than the other sub-alternatives. **Sub-alternatives 2a**, **2b, 3a,** and **3b** could result in positive biological impacts if closures occurred during the beginning of peak spawning for yellowtail snapper; however, biological benefits for other sub-alternatives would likely be greater An indirect biological benefit would result from **Preferred Alternative 1 (No Action)** in that future stock

assessments for the species would be consistent with previous ones. Of the four sub-alternatives that consider a spawning season closure for the commercial sector, **Sub-alternatives 4a** and **4b** would provide a longer closure and therefore result in greater biological benefits than **Sub-alternatives 4c** and **4d**.

Because yellowtail snapper in South Florida spawn mainly from April through August, a fishing year that starts after August, as proposed under **Sub-alternatives 2d** and **3d**, would likely add the most protection to the stock if both the commercial and recreational sectors close prior to the end of the fishing year. The earlier the closure, the greater the biological benefits. **Sub-alternatives 2c** and **3c** would provide the next best level of protection under the same circumstances. However, such early closures could have negative economic and social effects as indicated by the South Atlantic Council's decision to request an emergency rule.

Relative to **Preferred Alternative 1 (No Action)**, **Sub-alternative 4a** would produce the greatest reduction in gross revenue under either of the scenarios, followed by **Sub-alternative 4b**, **Sub-alternative 4c**, and **Sub-alternative 4d (Table 2.2.1)**. The reduction in gross revenue of concurrently harvested non-yellowtail snapper species is the inverse order, with the greatest reduction occurring under **Sub-alternative 4d**, followed by **Sub-alternative 4b**, **Sub-alternative 4c**, and **Sub-alternative 4a**. Most importantly, the reduction in total gross revenue would be greatest under **Sub-alternative 4a**, followed by **Sub-alternative 4b**, **Sub-alternative 4c**, and **Sub-alternative 4d**.

Table 2.2.1. Economic Effects of sub-alternatives under **Alternative 4** for **Action 2**.

	Sub-alt. 4a	**Sub-alt. 4b**	**Sub-alt. 4c**	**Sub-alt. 4d**
Percentage of 2007-2011 yellowtail landings	38%	32%	24%	23%
Percentage of 2007-2011 other species landings	23%	30%	28%	32%
Reductions assuming 2007-2011 average landings				
Reduction in yellowtail gross revenue	$1,075,303	$897,966	$687,027	$641,746
Reduction in non-yellowtail gross revenue	$211,953	$275,382	$251,953	$291,846
Reduction in total gross revenue	$1,287,256	$1,173,348	$938,980	$933,592
Reductions assuming ACL is fully targeted*				
Reduction in yellowtail gross revenue	$1,917,825	$1,601,540	$1,225,326	$1,144,567

*This refers to losses comparing the ACL to landings in months closed without any effort shift.

Sub-alternatives 4a and **4b** would close the commercial sector over the longest period of time and occur during the time of the year when peak commercial harvest has occurred. These sub-alternatives would likely have the largest negative social effects and change fishing patterns the most. **Sub-alternatives 4c** or **4d** would also result in closing of the commercial sector during peak commercial harvesting but for a smaller period of time and, therefore, would have fewer negative social impacts than **Sub-alternatives 4a** and **4b**. Furthermore, since yellowtail snapper are harvested in the Gulf of Mexico and South Atlantic, changing the fishing year could create confusion for fishermen in south Florida and possibly have negative social effects if one side of the Florida Keys is open to harvest of yellowtail snapper and the other is closed.

Proposed **Alternatives 2** and **3** could impact the administrative environment by possibly complicating the performance of future stock assessments whereas **Alternative 4** would result in increased administrative burden from issuance of Fishery Bulletins and other informational materials on an annual

basis. All of the proposed alternatives, therefore, would impact the administrative environment relative to **Preferred Alternative 1 (No Action)**. Administrative impacts would also be expected if there are different regulations and openings/closings of yellowtail snapper in the Gulf of Mexico versus the South Atlantic portions of the Florida Keys. Further, public confusion regarding the different fishing years or spawning season closures in the Gulf Mexico versus the South Atlantic portion of South Florida could create Law Enforcement difficulties.

2.3 Action 3. Gag and Shallow Water Groupers: Commercial Annual Catch Limit and Accountability Measures

Alternative 1 (No Action). Retain the gag ACL and the following three commercial AMs:
(1) If gag commercial landings, as estimated by the Science and Research Director (SRD), reach or are projected to reach the quota, the Assistant Administrator for Fisheries (AA) will file a notification with the Office of the Federal Register to close the commercial fishery for gag and all other South Atlantic shallow water grouper (SASWG) for the remainder of the fishing year. SASWG includes gag, black grouper, red grouper, scamp, red hind, rock hind, yellowmouth grouper, yellowfin grouper, graysby, and coney.

(2) Individual ACLs and AMs are in place for black grouper, red grouper, and scamp. If the ACLs are projected to be met, the species are closed in-season. For red grouper, reduce the ACL by overages the following year. For black grouper and scamp, reduce the ACL by overages the following year if overfished.

(3) If commercial landings for other SASWG (<u>including red hind, rock hind, yellowmouth grouper, yellowfin grouper, coney, and graysby</u>), as estimated by the SRD, reach or are projected to reach the commercial ACL of 49,488 lb (22,447 kg), round weight, the AA will file a notification with the Office of the Federal Register to close the commercial sector for this complex for the remainder of the fishing year. On and after the effective date of such a notification, all sale or purchase of other SASWG is prohibited, and harvest or possession of these species in or from the South Atlantic EEZ is limited to the bag and possession limit. This bag and possession limit applies in the South Atlantic on board a vessel for which a valid Federal charter vessel/headboat permit for South Atlantic snapper-grouper has been issued, without regard to where such species were harvested, i.e., in state or Federal waters. If commercial landings exceed the ACL, and at least one of the species in the other SASWG complex is overfished, based on the most recent status of U.S. Fisheries Report to Congress, the AA will file a notification with the Office of the Federal Register, at or near the beginning of the following fishing year to reduce the ACL for that following year by the amount of the overage in the prior fishing year.

The adjusted gag commercial ACL is 352,940 lbs gutted weight (gw).

Alternative 2. Change the (1) AM as listed under the **Alternative 1 (No Action)** to the following:
If gag commercial landings, as estimated by the SRD, reach or are projected to reach the ACL, the AA will file a notification with the Office of the Federal Register to close the commercial fishery for gag for

the remainder of the fishing year. Retain (2) and (3) of the commercial AMs as stated under **Alternative 1 (No Action)**.

Preferred Alternative 3. Change the (1) AM as listed under the **Alternative 1 (No Action)** to the following:
If gag commercial landings, as estimated by the SRD, reach or are projected to reach the ACL, the AA will file a notification with the Office of the Federal Register to close the commercial fishery for gag for the remainder of the fishing year. Retain (2) and (3) of the commercial AMs as stated under the **Alternative 1 (No Action)**. Reduce the unadjusted gag commercial ACL from 353,940 lbs gw to 326,722 lbs gw to account for projected gag discard mortality from commercial trips that target co-occurring species (i.e., red grouper and scamp) following a projected gag closure.

NOTE: The current gag ACL was adjusted for post-quota bycatch mortality in accordance with analyses in Snapper Grouper Amendment 16 (Amendment 16). The unadjusted commercial gag ACL is 353,940 lbs gw. Landings relative to the ACLs are shown in **Table 2.3.1**.

Table 2.3.1. Commercial and recreational landings (lbs gw) of gag relative to quota/ACLs for 2009-2012.

Year	Commercial Quota/ACL	Commercial Landings	Commercial Over/Under	Commercial %Over/Under	Recreational Quota/ACL	Recreational Landings	Recreational Over/Under	Recreational %Over/Under
2009	352,940	248,024	104,916	83%	N/A	N/A	N/A	N/A
2010	352,940	235,272	117,668	72%	N/A	N/A	N/A	N/A
2011	352,940	426,667	80,005	121%	340,060	169,854	170,206	50%
2012	352,940	346,662	6,278	98%	340,060	111,695	228,365	33%

Source: Marine Recreational Information Program and Southeast Fisheries Science Center Commercial Landings System.
Note: Recreational landings are incomplete for 2012. Commercial AM was not triggered for gag in 2011 overage of ACL was not realized until fishing year was ended. The commercial AM was triggered in 2012.

2.2.3 A Summary of the Effects of the Alternatives

Amendment 16 (SAFMC 2009a) established a provision to prohibit harvest of all shallow water grouper species when the gag quota is met or is expected to be met (**Alternative 1 (No Action)**). Prior to 2012, there was never an in-season closure of gag due to the quota being met; however, gag discards have declined since the implementation of Amendment 16 in 2009. In 2010 and 2011, the Reauthorized Magnuson-Stevens Act required the implementation of ACLs and AMs for all managed species (with some statutory exceptions), which has resulted in the in-season prohibition of harvest of many snapper grouper species that co-occur with gag. The gag spawning season closure and in-season closures of species that co-occur with gag may be responsible for the decline in gag commercial discards. In general, the biological benefits of **Alternative 2** could be less than those of **Alternative 1 (No Action)**, but harvest of all species would continue to be dictated by the established ACLs and AMs, thus ensuring that overfishing does not occur. In terms of gag bycatch, **Alternative 2** would result in low negative biological impacts since recent studies suggest that with the exception of red grouper and scamp, gag are not as closely associated in the landings with the rest of the shallow water grouper species. As **Preferred Alternative 3** proposes to reduce the commercial ACL for gag to account for any discard mortality of gag

that would result from targeting other shallow water groupers after gag quota is met, this alternative would be expected to have a greater biological benefit for gag than **Alternative 1 (No Action)**, and similar biological effects as **Alternative 2**. **Alternatives 2** and **3 (Preferred)** would have a decreased biological effect for other shallow water grouper species since harvest could continue after the gag quota had been met. However, ACLs are in place for the other shallow water grouper species, which would ensure overfishing of these species did not occur and harvest was maintained at sustainable levels.

The total loss in gross revenue under **Alternative 1 (No Action)** is estimated to be $1,239,950. This estimate is based on the total gross revenue from commercial trips targeting species in the SASWG complex between October 20 and December 31 (since the 2012 closure was implemented on October 20), and that from landings of gag from trips targeting species other than SASWG. The loss in gross revenue under **Alternative 2** is estimated to be $976,107 in absolute terms. However, relative to **Alternative 1 (No Action)**, **Alternative 2** would result in a gain of $263,843 in gross revenue. Under **Preferred Alternative 3**, the AM would be the same as under **Alternative 2**; however, the reduction in the ACL would partially offset that gain. Due to the unavailability of 2012 data, combined with the fact that the commercial ACL was exceeded in December of 2011, it is not possible to accurately predict how much earlier a closure would occur with a reduced commercial ACL of 326,722 lbs gw under **Preferred Alternative 3**. Since the difference between the current and proposed ACL is 26,218 lbs gw and the average price per pound of gag in 2011 was $5.42, the loss in gross revenue due to the reduced ACL is estimated to be $142,102. The loss in gross revenue would be greater if the lower ACL causes the cancelation of trips targeting gag and the loss of all gross revenue from species harvested on those trips. Since the losses associated with the potential cancelation of those trips cannot be estimated with currently available data, the net gain in gross revenue under **Preferred Alternative 3** relative to **Alternative 1 (No Action)** is $121,741. Since the ACL would not be reduced under **Alternative 2**, the gain in gross revenue under **Alternative 2** would be $142,102 greater than under **Preferred Alternative 3** (i.e., the full $263,843). Thus, economic benefits are greatest under **Alternative 2**, followed by **Preferred Alternative 3**, and least under **Alternative 1 (No Action)**.

In terms of social impacts, **Alternatives 2** and **3 (Preferred)** modify the AM to allow harvest of shallow water grouper when gag closes and should have social benefits, as the continued harvest of these species would provide important revenues and prevent changes in fishing patterns. The reduction in the gag commercial ACL as a result of anticipated discards coming from continued harvest of shallow water grouper, as proposed in **Preferred Alternative 3,** may have negative social effects on gag fishermen, but should provide more protection for the stock and therefore be positive in the long-term. **Preferred Alternative 3** would best minimize negative biological effects for gag while having positive social effects for those individuals who would want to target other shallow water grouper species after the gag quota is met.

Chapter 3. Affected Environment

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

Affected Environment

- **Habitat environment (Section 3.1)**

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

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

  Examples include populations of groupers, corals, and turtles

- **Human environment (Section 3.3)**

  Examples include fishing communities and economic descriptions of the fisheries

- **Administrative environment (Section 3.4)**

  Examples include the fishery management process and enforcement activities

3.1 Habitat Environment

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

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

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

More detail on these habitat types is found in Volume II of the South Atlantic Fishery Management Council's (South Atlantic Council) Fishery Ecosystem Plan (SAFMC 2009b) available at: http://www.safmc.net/ecosystem/Home/EcosystemHome/tabid/435/Default.aspx. EFH and EFH-HAPCs are discussed below. Additional details are found in **Appendix B**.

3.1.1 Essential Fish Habitat

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

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

of larvae and growth up to and including settlement. In addition, the Gulf Stream is also EFH because it provides a mechanism to disperse snapper grouper larvae.

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

3.1.2 Habitat Areas of Particular Concern

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

3.2 Biological and Ecological Environment

The reef environment in the South Atlantic management area affected by actions in this environmental assessment is defined by two components (**Figure 3.1.1**). Each component will be described in detail in the following sections.

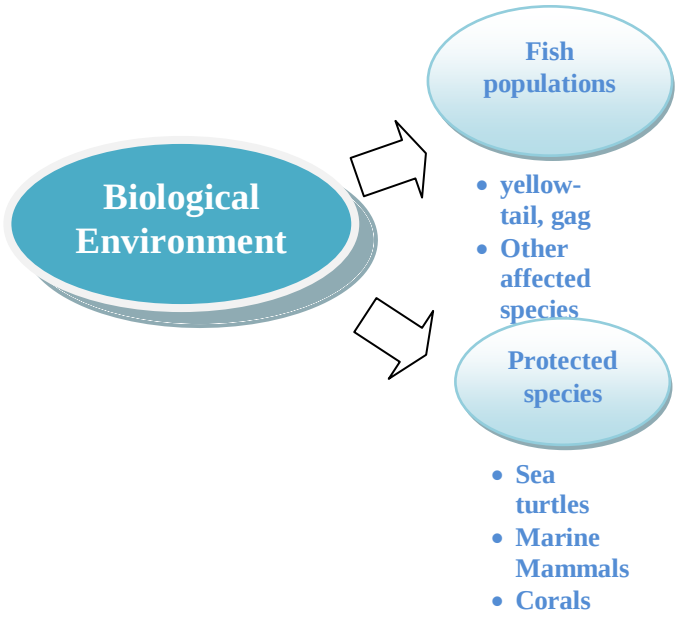

Figure 3.1.1. Two components of the biological environment described in this document.

3.2.1 Fish Populations

The waters off the South Atlantic coast are home to a diverse population of fish. The snapper grouper fishery management unit contains 60 species of fish, many of them neither "snappers" 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 together dictates the nature of the fishery (multi-species) and further forms the type of management regulations proposed in this document.

Other snapper grouper species commonly taken with those directly affected by the actions proposed in this amendment could be affected by the action. Snapper grouper species most likely to be affected by

the proposed actions include species that occupy the same habitat at the same time (see **Section 3.2.2** for a list of the co-occurring species).

Yellowtail Snapper

Yellowtail snapper, *Ocyurus chrysurus*, occurs in the Western Atlantic, ranging from Massachusetts to southeastern Brazil, including the Gulf of Mexico and Caribbean Sea, but is most common in the Bahamas, off south Florida, and throughout the Caribbean. Most U.S. landings are from the Florida Keys and southeastern Florida. The yellowtail snapper inhabits waters as deep as 180 m (590 ft), and usually is found well above the bottom (Allen 1985). Muller et al. (2003) state that adults typically inhabit sandy areas near offshore reefs at depths ranging from 10 to 70 m (33-230 ft). Thompson and Munro (1974) indicate that this species is most abundant at depths of 20-40 m (66-131 ft) near the edges of shelves and banks off Jamaica. Juveniles are usually found over back reefs and seagrass beds (Thompson and Munro 1974; Muller et al. 2003). Yellowtail snapper exhibits schooling behavior (Thompson and Munro 1974).

Maximum reported size is 86.3 cm (34.2 in) TL (male) and 4.1 kg (9.1 lbs) (Allen 1985). Maximum age is 17 years (Manooch and Drennon 1987). Natural mortality is estimated at 0.20 with a range of 0.15-0.25 (Muller et al. 2003). There is a truncation in the size and age structure of yellowtail snapper near human population centers.

Yellowtail snapper have separate sexes throughout their lifetime (i.e., they are gonochoristic). Figuerola et al. (1997) estimated size at 50% maturity as 22.4 cm (8.9 in) FL (males) and 24.8 cm (9.8 in) FL (females), based on fishery independent and dependent data collected off Puerto Rico.

Spawning occurs over a protracted period and peaks at different times in different areas. In southeast Florida, spawning occurs during spring and summer, while it may occur year-round in the Bahamas and Caribbean (Grimes 1987). Figuerola et al. (1997) reported that, in the U.S. Caribbean, spawning occurs during February to October, with a peak from April to July. Erdman (1976) reported that 80% of adult yellowtail snapper captured off San Juan spawn during March through May. Spawning occurs in offshore waters (Figuerola et al. 1997; Thompson and Munro 1974) and during the new moon (Figuerola et al. 1997). Large spawning aggregations are reported to occur seasonally off Cuba, the Turks and Caicos, and USVI. A large spawning aggregation occurs during May-July at Riley's Hump near the Dry Tortugas off Key West, Florida (Muller et al. 2003).

Yellowtail snapper are nocturnal predators. Juveniles feed primarily on plankton (Allen 1985; Thompson and Munro 1974). Adults eat a combination of planktonic (Allen 1985), pelagic (Thompson and Munro 1974), and benthic organisms, including fishes, crustaceans, worms, gastropods, and cephalopods (Allen 1985). Bortone and Williams (1986) stated that both juveniles and adults feed on fish, shrimp, and crabs.

Stock Status of Yellowtail Snapper

A benchmark assessment for yellowtail snapper was conducted by the state of Florida in 2012 with data through 2010 (FWRI 2012). Most of the data sources were simply updated with the additional years of observations available since the SEDAR 3 benchmark (SEDAR 2003). Additional changes made in

some sources, such as recreational length measurements, indices, and discards are detailed below. In addition, changes were made in model configuration to address new information, management actions, and improvements in the estimation of assessment uncertainty. Several sensitivity runs were performed to explore the model's sensitivity to changes in the release mortality.

Substantial changes are underway in recreational harvest surveys with implementation of the Marine Recreational Information Program (MRIP) in place of the prior Marine Recreational Statistics Survey (MRFSS). Although the MRIP program promises improved data for the future, assessments must also consider the past and will continue to include the earlier data from the MRFSS program. At the time the 2012 yellowtail snapper assessment was conducted, however, recreational landings based upon MRIP methods were not available. Therefore, recreational landings based on the old MRFSS methods were used.

Several indices used in the model are standardized, meaning that the catch per unit effort (CPUE) is adjusted through a statistical model to account for factors, other than changes in the population, which may affect the observed CPUE. Examples of such factors include yearly variation, environmental factors, depth, and sampling characteristics. While this approach improves the information obtained from the index, estimates of the parameters included in the standardization model change each time additional years of data are added, therefore changing the CPUE index for the entire time series.

Another important change from SEDAR 3 is the estimate of discard mortality of released fish. A 30% discard mortality was used in SEDAR 3. The 2012 assessment was able to estimate discard mortality using observer data from the headboat survey, which started in 2002. A 10% release mortality was used in the 2012 assessment, based on headboat observer data, with sensitivity runs at 20% and 30% to account for latent release mortality (those fish that may have died sometime after being released alive). Also, the age composition of released fish was calculated using aged catch data from 2005-2010 and then applied back to the remainder of the years in the time period.

There were also several minor changes made to the data and model inputs in the 2012 assessment as compared to SEDAR 3. New data, collected since SEDAR 3 was conducted, resulted in a change in maximum age from 17 years to 23 years. The change in maximum age resulted in a change in the estimated natural mortality (M). Also, age-specific M was estimated in the 2012 assessment, as opposed to the age constant estimate that was used in SEDAR 3. New data also led to a modification of the estimated spawning date to the mid-point of April 1-October 1. Finally, it was found during the review of SEDAR 3 that some of the headboat lengths were taken using natural total length (TL) instead of "maximum" TL. "Maximum" TL is when the fish's tail is pinched before measuring the length, whereas natural TL is taken without pinching the tail. In the 2012 assessment, all of the natural TLs were converted to "maximum" TLs.

The 2012 assessment shows that yellowtail snapper are not overfished and overfishing is not occurring. The spawning stock biomass (SSB) is over three times higher than the SSB that would produce Maximum Sustainable Yield, or SSB_{MSY} (335.7% of SSB_{MSY}, **Table 3.2.1**). Current fishing mortality (F) is well below F_{MSY} (18.9% of F_{MSY}, **Table 3.2.1**). Stock biomass shows a period of stability until the mid-1990s followed by an increasing trend that continues to the present (**Figure 3.2.1**). Also, there is no trend in the level of recruitment entering the stock, but there is a large amount of year-to-year

variation (**Figure 3.2.2**). The fact that the population has continued to grow over this time period despite large fluctuations in recruitment, coupled with the fact that F is only 19% of F_{MSY} and SSB is over three times higher than SSB_{MSY}, suggests that recruitment for yellowtail snapper is not being affected by stock size or fishing pressure during the assessment time period, but by variations in environmental factors. These diagnostics suggest that the stock is being sustainably harvested and that the rate of exploitation and total take can increase from current levels without detriment to the stock.

Table 3.2.1. Management parameters from the 2012 benchmark assessment for yellowtail snapper. Values are given for maximum sustainable yield (MSY), the fishing mortality at MSY (F_{MSY}), the fishing mortality from the terminal year of the assessment (F_{2010}), spawning stock biomass at MSY (SSB_{MSY}), the minimum stock size threshold (MSST), and the spawning stock biomass from the terminal year of the assessment (SSB_{2010}).

Parameter	Value
F_{MSY}	0.24
F_{2010}	0.0454
SSB_{MSY} (mt)*	3,072
MSST (mt)	2,488
SSB_{2010} (mt)	10,311
MSY (mt)	2,088

* The value of SSB_{MSY} given here is calculated using the original proxy value of MSY, which is 30% of the spawning potential ratio and has a value of 1,700 mt. The estimated empirical value of SSB_{MSY} was not available in the assessment report.

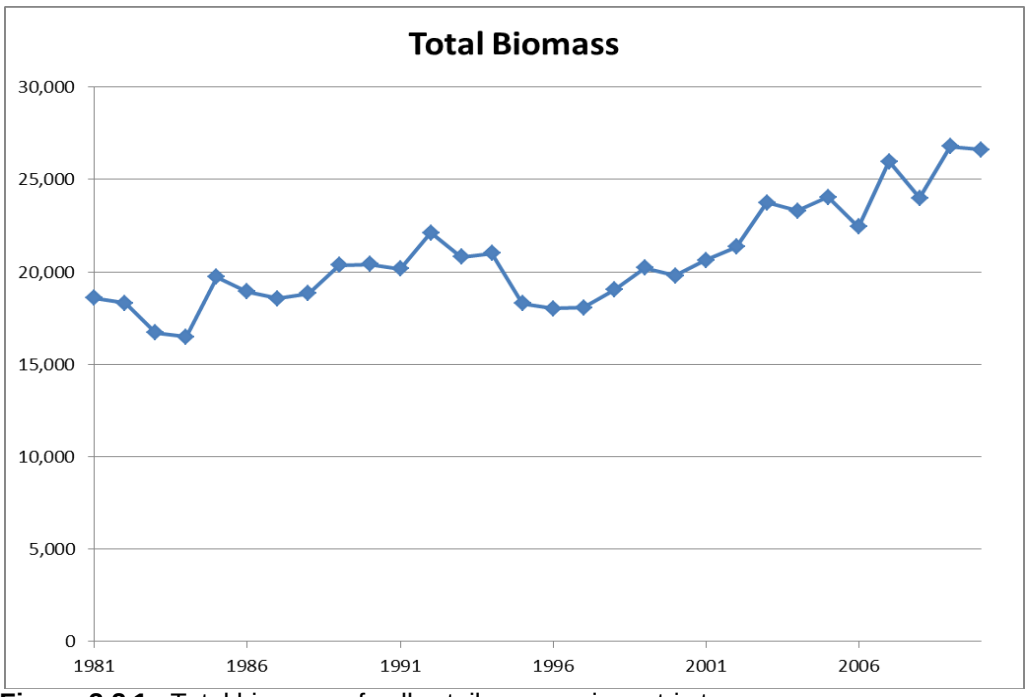

Figure 3.2.1. Total biomass of yellowtail snapper in metric tons.
Data are from the 2012 assessment report for yellowtail snapper, Florida Fish and Wildlife Conservation Commission.

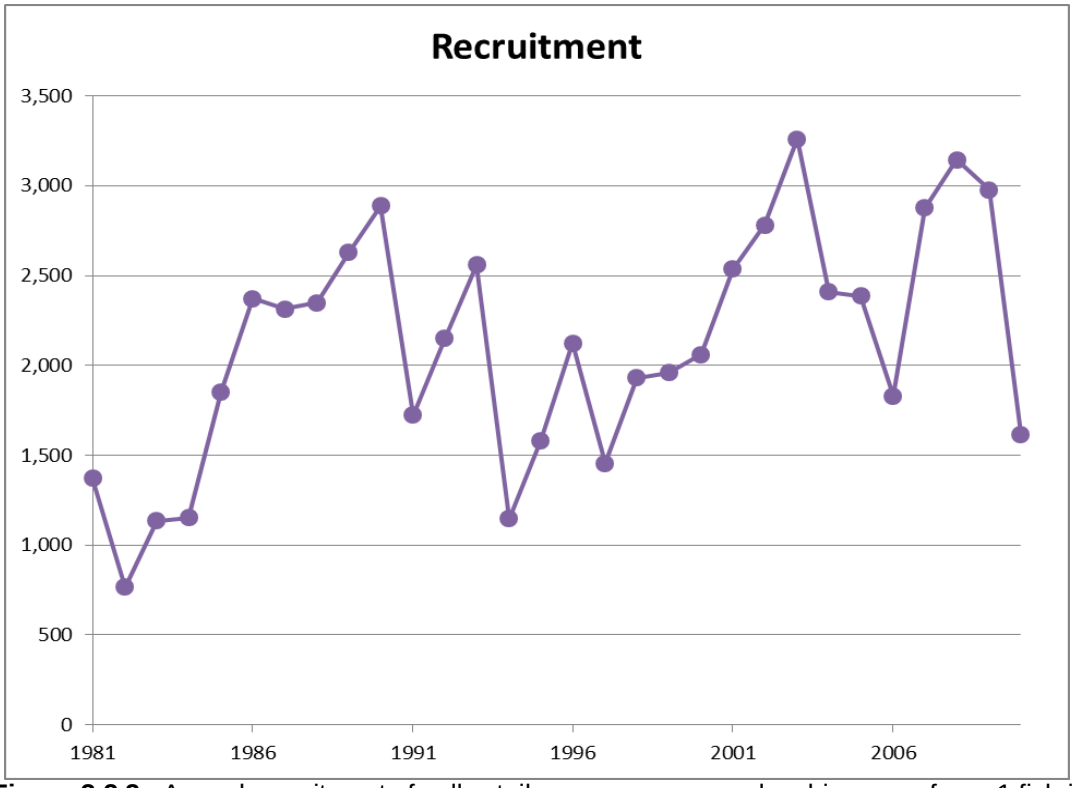

Figure 3.2.2. Annual recruitment of yellowtail snapper expressed as biomass of age 1 fish in metric tons. Data are from the 2012 assessment report for yellowtail snapper, Florida Fish and Wildlife Conservation Commission.

Gag

Gag, *Mycteroperca microlepis*, occur in the Western Atlantic from North Carolina to the Yucatan Peninsula, and throughout the Gulf of Mexico. Juveniles are sometimes observed as far north as Massachusetts (Heemstra and Randall 1993). Gag commonly occurs at depths of 39-152 m (131-498 ft) (Heemstra and Randall 1993) and prefers inshore-reef and shelf-break habitats (Hood and Schlieder 1992). Bullock and Smith (1991) indicated that gag probably do not move seasonally between reefs in the Gulf of Mexico, but show a gradual shift toward deeper water with age. McGovern et al. (2005) reported extensive movement of gag along the Southeast United States. In a tagging study, 23% of the 435 recaptured gag moved distances greater than 185 km. Most of these individuals were tagged off South Carolina and were recaptured off Georgia, Florida, and in the Gulf of Mexico (McGovern et al. 2005).

Gag are considered estuarine dependent (Keener et al. 1988; Ross and Moser 1995; Koenig and Coleman 1998; Strelcheck et al. 2003). Juveniles (age 0) occur in shallow grass beds along Florida's east coast during the late spring and summer (Bullock and Smith 1991). Sea grass is also an important nursery habitat for juvenile gag in North Carolina (Ross and Moser 1995). Post-larval gag enter South Carolina estuaries when they are 13 mm TL and 40 days old during April and May each year (Keener et al. 1988), and utilize oyster shell rubble as nursery habitat. Juveniles remain in estuarine waters throughout the summer and move offshore as water temperatures cool during September and October. Adults are often

seen in shallow water 5-15 m (16-49 ft) above the reef (Bullock and Smith 1991) and as far as 40-70 km (25-44 ft) offshore.

Huntsman et al. (1999) indicated that gag are vulnerable to overfishing since they are long-lived, late to mature, change sex, and aggregate to spawn. The estimated natural mortality rate is 0.15 (Potts et al. 1998). Maximum reported size for gag is 145 cm (57.5 in) TL and 36.5 kg (81 lbs) (Heemstra and Randall 1993), and maximum reported age is 26 years (Harris and Collins 2000). Almost all individuals less than 87.5 cm (34.7 in) TL are females. At 105.0 cm (41.6 in) TL, 50% of fishes are males, while almost all gag are males at sizes greater than 120.0 cm (47.5 in) TL (McGovern et al. 1998).

Along the southeastern United States (1994-1995), size at first maturity is 50.8 cm (20.2 in) TL, and 50% of gag females are sexually mature at 62.2 cm (24.7 in) (McGovern et al. 1998). According to Harris and Collins (2000), age-at-first-maturity is 2 years, and 50% of gag are mature at 3 years. For data that were collected during 1978-1982 off the southeastern United States, McGovern et al. (1998) reported that the smallest mature females were 58.0 cm (22.9 in) TL and 3 years old. Hood and Schlieder (1992) indicated that most females reach sexual maturity at ages 5-7 in the Gulf of Mexico. Off the southeastern United States, gag spawn from December through May, with a peak in March and April (McGovern et al., 1998). Duration of planktonic larvae is about 42 days (Keener et al. 1988; Koenig and Coleman 1998; Lindeman et al. 2000). McGovern et al. (1998) reported that the percentage of male gag landed by commercial fishermen decreased from 20% during 1979-1981 to 6% during 1995-1996. This coincided with a decrease in the mean length of fish landed. A similar decrease in the percentage of males was reported in the Gulf of Mexico (Hood and Schleider 1992; Coleman et al. 1996).

Adults are sometimes solitary, or can occur in groups of 5 to 50 individuals, especially during the spawning season. They feed primarily on fishes, but also prey on crabs, shrimps, and cephalopods (Heemstra and Randall 1993), and often forage in small groups far from the reef ledge (Bullock and Smith 1991). Juveniles feed primarily on crustaceans, and begin to consume fishes when they reach about 25 mm (1 in) in length (Bullock and Smith 1991; Mullaney 1994).

Stock Status of Gag

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

A stock assessment of gag was conducted in 2006, using data through 2004 (SEDAR 10 2006). Results of that assessment indicated that the gag stock is **undergoing overfishing** as of 2004 (last year of data in the stock assessment). Further, the stock assessment results showed that, as of the start of 2005, the gag stock in the Atlantic is **not overfished**.

The South Atlantic Council took action to end overfishing of gag grouper through Amendment 16 (SAFMC 2009a). The amendment included measures to reduce the aggregate bag limit for groupers and tilefish; reduce the bag limit for gag or black grouper combined; establish a quota for the commercial

harvest of gag; and establish restrictions on the possession, sale, and purchase of gag and associated shallow water grouper species after the gag quota was met.

Red grouper

Red grouper, *Epinephelus morio*, is primarily a continental species, mostly found in broad shelf areas (Jory and Iversen 1989). Distributed in the Western Atlantic, from North Carolina to southeastern Brazil, including the eastern Gulf of Mexico and Bermuda, but can occasionally be found as far north as Massachusetts (Heemstra and Randall 1993). The red grouper is uncommon around coral reefs; it generally occurs over flat rock perforated with solution holes (Bullock and Smith 1991), and is commonly found in the caverns and crevices of limestone reef in the Gulf of Mexico (Moe 1969). It also occurs over rocky reef bottoms (Moe 1969).

Adult red grouper are sedentary fish that are usually found at depths of 5-300 m (16-984 ft). Fishermen off North Carolina commonly catch red grouper at depths of 27-76 m (88-249 ft) for an average of 34 m (111 ft). Fishermen off southeastern Florida also catch red grouper in depths ranging from 27-76 m (88-249 ft) with an average depth of 45 m (148 ft) (Burgos 2001; McGovern et al. 2002). Moe (1969) reported that juveniles live in shallow water nearshore reefs until they are 40.0 cm (16 in) and 5 years of age, when they become sexually mature and move offshore. Spawning occurs during February-June, with a peak in April (Burgos 2001). In the eastern Gulf of Mexico, ripe females are found December through June, with a peak during April and May (Moe 1969). Based on the presence of ripe adults (Moe 1996) and larval red grouper (Johnson and Keener 1984) spawning probably occurs offshore. Coleman et al. (1996) found groups of spawning red grouper at depths between 21-110 m (70-360 feet). Red grouper do not appear to form spawning aggregation or spawn at specific sites (Coleman et al. 1996). They are reported to spawn in depths of 30-90 m (98-295 ft) off the Southeast Atlantic coast (Burgos 2001; McGovern et al. 2002).

Off North Carolina, red grouper first become males at 50.9 cm (20.1 in) TL and males dominate size classes greater than 70.0 cm (27.8 in) TL. Most females transform to males between ages 7 and 14. Burgos (2001) reported that 50% of the females caught off North Carolina are undergoing sexual transition at age 8. Maximum age reported by Heemstra and Randall (1993) was 25 years. Burgos (2001) and McGovern et al. (2002) indicated that red grouper live for at least 20 years in the Southeast Atlantic and a maximum age of 26 years has been reported for red grouper in the Gulf of Mexico (L. Lombardi, NMFS Panama City, personal communication). Natural mortality rate is estimated to be 0.20 (Potts and Brennan 2001). Maximum reported size is 125.0 cm (49.2 in) TL (male) and 23.0 kg (51.1 lb). For fish collected off North Carolina during the late 1990s, age at 50% maturity of females is 2.4 years and size at 50% maturity is 48.7 cm (19.3 in) TL. Off southeastern Florida, age at 50% maturity was 2.1 years and size at 50% maturity was 52.9 cm (21.0 in) TL (Burgos 2001; McGovern et al. 2002a). These fish eat a wide variety of fishes, octopuses, and crustaceans, including shrimp, lobsters, and stomatopods (Bullock and Smith 1991; Heemstra and Randall 1993).

Stock Status of Red Grouper

The South Atlantic stock of red grouper was assessed in 2009, using data through 2008 (SEDAR 19 2010). The assessment results indicated South Atlantic red grouper to be **overfished** and **undergoing**

overfishing. The South Atlantic Council received notification of the overfished status of the red grouper stock on June 9, 2010. The Magnuson-Stevens Act specifies that measures to end overfishing must be implemented within two years of notification. Hence, the South Atlantic Council began development of Snapper Grouper Amendment 24 (Amendment 24; SAFMC 2011d) to end overfishing of red grouper and put in place a rebuilding plan. Prior to the completion of SEDAR 19, however, Amendment 16 was implemented. The amendment put in place a four-month spawning season closure for gag and shallow water groupers (including red grouper). Based on 2010 red grouper catch data, the management measures implemented through Amendment 16 were sufficient to limit recreational landings of red grouper to a sustainable level.

Amendment 24 put in place accountability measures for both the recreational and commercial sectors and specified a rebuilding schedule of 10 years (with 2011 being year 1). The South Atlantic Council chose a rebuilding strategy for red grouper that sets ABC equal to the yield at 75%F_{MSY}. Under this strategy, red grouper would have at least a 50% chance of rebuilding to SSB_{MSY} by 2016. Amendment 24 was implemented in June 2012.

Black grouper

The black grouper, *Mycteroperca bonaci*, occurs in the Western Atlantic, from North Carolina to Florida, Bermuda, the Gulf of Mexico, West Indies, and from Central America to Southern Brazil (Crabtree and Bullock 1998). Adults are found over hard bottom such as coral reefs and rocky ledges. Black grouper occur at depths of 9 to 30 m (30 to 98 ft). Juveniles sometimes occur in estuarine seagrass and oyster rubble habitat in North Carolina and South Carolina (Keener et al. 1988; Ross and Moser 1995). In the Florida Keys, juveniles settle on patch reefs (Sluka et al. 1994). Commercial landings of black grouper exceed landings of any other grouper in the Florida Keys.

Natural mortality is estimated to be 0.15 (Potts and Brennan 2001). Crabtree and Bullock (1998) found that black grouper live for at least 33 years and attain sizes as great as 151.8 cm (60.1 in) TL. Females ranged in length from 15.5 to 131.0 cm (6.1-51.9 in) TL and males range in length from 94.7 to 151.8 cm (38.3-60.1 in) TL. Black grouper are protogynous. Approximately 50% of females are sexually mature by 82.6 cm (32.7 in) TL and 5.2 years of age. At a length of 121.4 cm (48.1 in) TL and an age of 15.5 years, approximately 50% of the females have become males. Black grouper probably spawn throughout the year. However, peak spawning of females occurs from January to March.

Off Belize, black grouper are believed to spawn in aggregations at the same sites used by Nassau grouper (Carter and Perrine 1994). Eklund et al. (2000) describe a black grouper spawning aggregation discovered during winter 1997-1998, less than 100 m outside a newly designated marine reserve. Adults feed primarily on fishes.

Stock Status of Black Grouper

Black grouper were assessed, along with red grouper, through SEDAR 19 (2010), utilizing data through 2008. The assessment determined the black grouper stock is **not undergoing overfishing** and is **not overfished**.

Scamp

Scamp, *Mycteroperca phenax*, occur in the Western Atlantic, from North Carolina to Key West, in the Gulf of Mexico, and in the southern portion of the Caribbean Sea. Juveniles are sometimes encountered as far north as Massachusetts (Heemstra and Randall 1993. Its reported depth range is 30-100 m (98-328 ft) (Heemstra and Randall 1993. Juveniles are found in estuarine and shallow coastal waters (Bullock and Smith 1991; Heemstra and Randall 1993.

Scamp are protogynous, with females dominating sizes less than 70.0 cm (27.8 in) (Harris et al. 2002). Scamp live for at least 30 years (Harris et al. 2002), and attain sizes as great as 107.0 cm (42.4 in) TL and 14.2 kg (31.3 lbs) (Heemstra and Randall 1993. Natural mortality rate is estimated to be 0.15 (Potts and Brennan 2001). Harris et al. (2002) report that the length and age at first spawning of females off North Carolina to southeast Florida was 30.0-35.0 cm (11.9-13.8 in) TL and age 1. Length and age at 50% maturity was 35.3 cm (13.9 in) TL and 1.28 years, respectively (Harris et al. 2002). In a study conducted in the eastern Gulf of Mexico, all fish larger than 35.0 cm TL were sexually mature (M. Godcharles and L. Bullock, unpublished data).

Spawning occurs from February through July in the South Atlantic Bight and in the Gulf of Mexico, with a peak in March to mid-May (Harris et al. 2002). Hydration of eggs occurs primarily during the morning and late afternoon, which indicates that scamp spawn during late afternoon and evening. Spawning individuals have been captured off South Carolina and St. Augustine, Florida at depths of 33 to 93 m. Scamp aggregate to spawn. Spawning locations and time of spawning overlaps with gag (Gilmore and Jones 1992). Fish are the primary prey of this species (Matheson et al. 1986).

Stock Status of Scamp

Scamp are not undergoing overfishing and the overfished status is unknown. The species was last assessed in 1998 using virtual population analysis (Manooch et al. 1998).

3.2.2 Other Species Affected

For details on the life histories of other shallow water groupers (red hind, rock hind, yellowmouth grouper, yellowfin grouper, coney, and graysby) refer to Volume II of the Fishery Ecosystem Plan (SAFMC 2009b) available at:
http://www.safmc.net/ecosystem/Home/EcosystemHome/tabid/435/Default.aspx.

In addition to the target species, snapper grouper species most likely to be affected by the proposed actions include species that occupy the same habitat at the same time. The following species are ones that are most likely to be affected. Refer to Volume II of the Fishery Ecosystem Plan (SAFMC 2009b) for details of these species' life histories. See link above.

Vermilion snapper, *Rhomboplites aurorubens*
Red porgy, *Pagrus pagrus*
Red snapper, *Lutjanus campechanus*
Gray triggerfish, *Balistes capriscus*

Scamp, *Mycteroperca phenax*
Almaco jack, *Seriola rivoliana*
Mutton snapper, *Lutjanus analis*

3.2.3 The Stock Assessment Process

Yellowtail snapper, gag, red grouper, and black grouper have been assessed through the Southeast Data, Assessment and Review (SEDAR) process. SEDAR is a cooperative Fishery Management Council process initiated 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 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.

3.2.4 Protected Species

There are 40 species protected by federal law that may occur in the EEZ of the South Atlantic Region and are under the purview of NMFS. Thirty-one of these species are marine mammals protected under the Marine Mammal Protection Act (MMPA), and six are also listed as endangered under the Endangered Species Act (ESA) (i.e., sperm, sei, fin, blue, humpback, and North Atlantic right whales). In addition to

those six marine mammals, five species of sea turtle (green, hawksbill, Kemp's ridley, leatherback, and loggerhead); the smalltooth sawfish; two *Acropora* coral species (elkhorn [*Acropora palmata*] and staghorn [*A. cervicornis*]), and five distinct population segments (DPS) of Atlantic sturgeon are protected under the ESA. **Section 3.5** of Snapper Grouper Amendment 17A (SAFMC 2010a) and **Section 3.2.2** in Snapper Grouper Regulatory Amendment 13 (under review), describe the life history characteristics in detail for these species. The potential impacts from the continued authorization of the South Atlantic snapper grouper fishery on all ESA-listed species have been considered in previous ESA Section 7 consultations. Summaries of those consultations and their determination are in **Appendix C**. Those consultations indicate that of the species listed above, sea turtles and smalltooth sawfish are the most likely to interact with the snapper grouper fishery.

3.3 Socio-economic Environment

3.3.1 Economic Environment

3.3.1.1 Economic Description of the Commercial Sector

A description of the commercial sector of the snapper grouper fishery is contained in Amendment 13C (SAFMC 2006), Amendment 15A (SAFMC 2008a), Amendment 15B (SAFMC 2008b), Amendment 16 (SAFMC 2009a), Amendment 17A (SAFMC 2010a), Amendment 17B (SAFMC 2010b), Regulatory Amendment 9 (SAFMC 2011a), Regulatory Amendment 10 (SAFMC 2010c), and the Comprehensive Annual Catch Limit (ACL) Amendment (SAFMC 2011c) and is incorporated herein by reference. A description of the yellowtail snapper component of the snapper grouper fishery is provided in the Comprehensive ACL Amendment (SAFMC 2011c) and is incorporated herein by reference. A description of the gag and/or shallow water grouper component of the snapper grouper fishery is contained in Amendment 16 (SAFMC 2009a), Amendment 17B (SAFMC 2010b), Regulatory Amendment 9 (SAFMC 2011a), and the Comprehensive ACL Amendment (SAFMC 2011c) and is incorporated herein by reference.

Economic data contained in the Comprehensive ACL Amendment (SAFMC 2011c) expressed real dollars in terms of 2010 dollars. Updates to that information are provided where appropriate and possible. For the current update, all dollar values have been converted to 2011 dollars. However, in estimating economic activities using the latest 5-year average, dollar values are expressed in 2008 dollars to be consistent with the available economic impact (business activity) model.

The Comprehensive ACL Amendment (SAFMC 2011c) contains numerous average annual (2005-2009) commercial sector performance statistics. In general, these statistics illustrate that gross revenue and landings fluctuate in the same direction, which suggests that ex-vessel demand is price elastic. The policy implication is that regulations that reduce industry landings in the short-term are expected to reduce gross revenue in the short-term. Conversely, gross revenue is

expected to increase over time if regulations successfully increase biomass and landings. Updates of all these statistics through 2011 are not available. Select statistics updated through 2011 are provided in the following paragraphs.

Snapper Grouper Amendment 17A (SAFMC 2010a) reported average annual commercial landings of all snapper grouper species in the South Atlantic from 2003-2007 of approximately 6.43 mp with an ex-vessel value of approximately $14.98 million. The corresponding average figures for 2008-2011 are 5.03 mp valued at $13.66 million. The resulting most recent five-year average (2007-2011) landings totals are approximately 5.33 mp valued at $14.28 million in 2011 dollars, or $13.66 million in 2008 dollars.

All landings (all trips and all species) by all vessels landing snapper grouper averaged approximately 11.24 mp valued at $24.74 million over 2003-2007 (SAFMC 2010a, with some corrections based on the most recent logbook data). Comparable average figures for 2008-2011 are 12.21 mp valued at $23.86 million. The most recent five year average (2007-2011) landings is 12.21 mp valued at $24.35 million.

From 2003 through 2007, an average of 890 commercial vessels per year harvested snapper grouper species and took an annual average of 14,665 trips. The corresponding figures for 2007 through 2011 are 865 vessels and 14,271 trips. Thus, for 2007 through 2011, average annual gross revenue per vessel in the snapper grouper fishery was approximately $28,150.

From 2003 through 2007, the largest portion of snapper grouper harvests was landed in Georgia and Florida (Georgia landings are combined with Florida for confidentiality considerations), or approximately 46%, followed by North Carolina (28%), and South Carolina (25%). This relative distribution of snapper grouper landings and revenue by state has largely remained the same for 2008-2011: Florida/Georgia accounted for 52% of landings and 47% of revenue, North Carolina for 28% of landings and 27% or revenue, and South Carolina for 20% of landings and 26% of revenue.

From 2003 through 2007, snapper grouper landings were mostly caught by hook-and-line (81%), with longline accounting for 6% of landings and other gear types at 13%. This relative distribution of landings by gear type remained the same for 2008-2011, although the share of hook-and-line fell slightly to 79% and the longline share slightly increased to 9%.

Based on information in **Table 3.3.1**, the average annual yellowtail snapper commercial harvest in the South Atlantic over the period 2007-2011 was approximately 895,145 pounds (lbs) gutted weight (gw). Landings during this time varied considerably from a low of about 610,000 lb gw in 2007 to a high of nearly 1.12 million lb gw in 2009, and thus have generally trended upward since 2007. More than 99% of commercially harvested yellowtail snapper are harvested off and landed in Florida and are harvested using hook-and-line gear. The average ex-vessel price per pound for yellowtail snapper over this period was approximately $3.00, but also varied somewhat during this time from a low of $2.77 in 2009 to a high of $3.17 in 2007 and 2011. As a result, this harvest resulted in an average of approximately $2.67 million per year in gross

revenue, ranging from a low of around $1.93 million in 2007 to a high of nearly $3.25 million in 2011, again trending upward during this time.

Vessels that harvest South Atlantic yellowtail snapper also harvest other species on trips that harvest yellowtail snapper. From 2007 through 2011, the average annual revenue from other species harvested on trips that harvest South Atlantic yellowtail snapper was approximately $904,871, ranging from a low of about $824,000 in 2007 to a high of more than $987,000 in 2009. Thus, the average annual revenue from all species harvested on trips on which yellowtail snapper were harvested was approximately $3.57 million, but varied considerably during this time; specifically ranging from a low of about $2.76 million in 2007 to a high of more than $4.08 million in 2011, and thus has been trending upward during this time.

As a result, on average, revenue from yellowtail snapper contributed approximately 74% of the total revenue from all species harvested on trips that harvested South Atlantic yellowtail snapper, but again varied somewhat from a low of approximately 70% in 2007, increasing to nearly 80% in 2011. Further, assuming a trip's primary target species is represented by the species accounting for the highest proportion of trip revenue, 83% of the trips harvesting South Atlantic yellowtail snapper were targeting South Atlantic yellowtail snapper. These statistics indicate that vessels are quite adept at targeting yellowtail snapper and have become more so over the past five years.

The majority of the average annual gross revenue from other species on trips harvesting South Atlantic yellowtail snapper came from the following species or species groups: shallow water grouper, particularly gag, black grouper, and scamp ($273,034, or 7.9%); shallow water snapper[1] other than yellowtail, particularly gray and mutton snapper ($171,028, or 5%); mid-depth snapper[2], particularly vermilion snapper ($129,000, or 3.7%); jacks ($89,544, or 2.6%); and king mackerel ($77,435, or 2.2%). Similarly, most of these same species represent the majority of the other species targeted on trips harvesting South Atlantic yellowtail snapper: gray snapper (4.7% of trips), king mackerel (3.1%), mutton snapper (1.5%), and black grouper (1.5%).

The number of trips (effort) harvesting South Atlantic yellowtail snapper averaged approximately 4,225 between 2007 and 2011. Although the number of trips was basically stable from 2007 to 2009, they dropped considerably to 3,727 trips in 2010. Thus, yellowtail snapper gross revenue per trip averaged about $640 during this time, increasing from a low of $436 in 2007 to $835 in 2011. Total gross revenue from all species on these trips averaged $855 between 2007 and 2011, increasing from $623 in 2007 to $1,049 in 2011.

The average number of vessels harvesting South Atlantic yellowtail snapper was 313 during this time period (**Table 3.3.1**), and trended similarly to the number of trips (i.e., around 335 from 2007 to 2009, decreasing considerably in 2010 to 293 and even further in 2011 to 266 vessels).

[1] Shallow water snapper include lane snapper, gray snapper, mutton snapper, yellowtail snapper, other snappers, and hogfish.
[2] Mid-depth snapper include vermilion snapper, red snapper, silk snapper, and other mid-depth snapper.

Thus, on a per vessel basis, average annual gross revenue from harvests of yellowtail snapper on trips harvesting yellowtail snapper was about $8,707 during this time, ranging from a low of $5,767 in 2007 to a high of $12,213 in 2011. Total gross revenue from all species on these trips averaged $11,619 per vessel between 2007 and 2011, increasing from $8,226 in 2007 to $15,340 in 2011.

The number of dealers purchasing South Atlantic yellowtail snapper was 133 on average during this time and has been much more stable than the number of trips or vessels, though a small decrease from 139 to 128 dealers occurred from 2010 to 2011(**Table 3.3.1**). Thus, on a per dealer basis, average annual gross revenue from harvests of yellowtail snapper on trips harvesting yellowtail snapper was about $20,182 during this time, increasing from a low of $14,417 in 2007 to a high of $25,380 in 2011. Total gross revenue from all species on these trips averaged $27,005 per dealer between 2007 and 2011, increasing from $20,565 in 2007 to $31,878 in 2011.

From 2007 through 2011, 639 vessels harvested South Atlantic yellowtail snapper in at least one of those years. However, only half or less of these vessels actually harvest yellowtail snapper in any given year given the information in **Table 3.3.1**. Thus, many vessels commonly enter and exit the yellowtail snapper component of the snapper grouper fishery's commercial sector from year to year. Further, the information in **Table 3.3.2** suggests that many of these vessels are not even active in commercial fishing in a given year as, on average, only 465 of these vessels (73%) showed any commercial fishing activity in a given year during this time. Thus, some of these vessels enter and exit southeast commercial fisheries from year to year as well, suggesting they operate in commercial fisheries on a part-time basis. On average, these vessels accounted for approximately $15.3 million in total gross revenue per year from 2007 through 2011. Average annual total gross revenue per vessel was approximately $32,949 during this time, increasing from $30,593 to $36,431 in 2011. Average annual gross revenue from yellowtail snapper was about $5,765, increasing from $4,093 to $7,317 from 2007 through 2011.

Based on the information in **Table 3.3.2**, vessels harvesting South Atlantic yellowtail snapper also take trips on which no South Atlantic yellowtail snapper are harvested, which would include trips harvesting Gulf yellowtail snapper. The landings and revenue associated with these trips constitute a substantial amount of the gross revenue for these vessels. Although harvests of South Atlantic yellowtail snapper account for the vast majority of revenue on trips that harvest yellowtail snapper, they represent a much smaller percentage of these vessels' total annual gross revenue on average (approximately 27.3%). This percentage has remained relatively stable from 2007 through 2011, though a slight decrease occurred in 2010 and 2011, indicating these vessels' dependence on yellowtail snapper revenue has also remained relatively unchanged during this time. This information further suggests that these vessels have become more dependent on revenue from coastal migratory pelagic species (e.g., king mackerel) and less dependent on revenue from shallow water grouper species (e.g., gag), which in turn indicates a change in these vessels' targeting behavior.

With respect to seasonality, according to the information in **Table 3.3.3**, commercial South Atlantic yellowtail snapper landings and associated revenue are highly seasonal. Landings, gross

revenue from yellowtail snapper and all species on trips harvesting yellowtail snapper, and the number of trips harvesting yellowtail snapper are highest from April through June and generally the lowest from December through February. However, although landings peak in June, the number of trips and gross revenue from yellowtail snapper peaks in April, and total gross revenue from these trips peaks in May. Total gross revenue is higher in May than April and June because gross revenue from other species is relatively higher in those months. Even though landings peak in June, gross revenue from yellowtail snapper is higher in May and particularly April because the average price is considerably higher. Specifically, average price is about 38% higher in April than in June. These figures illustrate a rather strong inverse relationship between landings and price (i.e., as landings decrease, price increases). Even though individual snapper grouper species are typically assumed to have many substitutes, these results suggest yellowtail snapper may be a species servicing a relatively localized market.

On a per trip basis, total gross revenue per trip is higher in May ($981) than in either June ($822) or April ($784). Assuming differences in the number of trips reflect cost differences, it can be concluded that trips in May are likely more valuable to yellowtail snapper fishermen than trips in June even if yellowtail snapper landings are higher in June.

As reflected in **Table 3.3.3**, vessel participation also varies seasonally, with peak participation occurring in May and June, as was the case for gross revenue from all species. However, while trips are unique to a particular month, as are the associated landings and revenue, vessels are not unique to a particular month as they can and frequently do harvest yellowtail snapper in more than one month in a given year. Thus, for example, although 104 vessels harvested yellowtail snapper in January on average and 103 vessels harvested yellowtail snapper in February on average, it cannot be logically concluded that 207 vessels harvested yellowtail snapper on average in January and February combined as some vessels likely harvest in both months and thus those vessels would be counted twice.

For the analyses discussed in **Section 4.2**, the following information is of importance. From 2007 through 2011, approximately 198 vessels harvested South Atlantic yellowtail snapper from April through June on average; 180 vessels harvested South Atlantic yellowtail snapper from June through August on average; 167 vessels harvested South Atlantic yellowtail snapper during April and May on average; and 157 vessels harvested South Atlantic yellowtail snapper during June and July on average. These results are partly driven by differences in the seasonal participation of vessels, but also by differences in the length of the time period considered for a potential spawning season closure (i.e., three months versus two months).

The seasonal participation of dealers in the purchase of yellowtail snapper follows almost exactly the same pattern as vessels, with the peak occurring in May and June (**Table 3.3.3**). Further, as with vessels, dealers typically purchase yellowtail snapper in more than one month in a given year and thus are not unique to a specific month. As such, the number of dealers in each month cannot be summed in order to determine dealer participation across multiple months as this would lead to double counting.

Thus, for the analyses discussed in **Section 4.2**, the following information is of importance. From 2007 through 2011, approximately 77 dealers purchased South Atlantic yellowtail snapper from April through June on average; 77 dealers purchased South Atlantic yellowtail snapper from June through August on average; 68 dealers purchased South Atlantic yellowtail snapper during April and May on average; and 65 dealers purchased South Atlantic yellowtail snapper during June and July on average. Again, these results are partly driven by differences in the seasonal participation of vessels, but also by differences in the length of the time period considered for a potential spawning season closure.

Table 3.3.1. Landings, Gross Revenue, Trips, Vessels, and Dealers by Year on South Atlantic Yellowtail Snapper Trips, 2007-2011.

Year	SA Yellowtail Snapper Landings (lbs gw)	Average Yellowtail Snapper Price	SA Yellowtail Snapper Gross Revenue	Other Species Gross Revenue	Total Gross Revenue	Percent SA Yellowtail Snapper Revenue	Number of Trips	Number of Vessels	Number of Dealers
2007	609,872	$3.17	$1,931,943	$823,816	$2,755,759	70.1	4,426	335	134
2008	803,347	$2.93	$2,349,799	$917,353	$3,267,151	71.9	4,423	336	130
2009	1,116,593	$2.77	$3,092,043	$987,050	$4,079,094	75.8	4,659	334	132
2010	919,540	$2.96	$2,726,230	$964,459	$3,690,689	73.9	3,727	293	139
2011	1,026,374	$3.17	$3,248,669	$831,678	$4,080,347	79.6	3,891	266	128

Source: NMFS SEFSC Coastal Fisheries Logbook and Accumulated Landings Data Base Systems, personal communication, Larry Perruso (2012).

Table 3.3.2. Landings and Revenue Statistics by Year for Vessels Harvesting Yellowtail Snapper from 2007-2011.

Year	Number of Vessels	Statistic	SA Yellowtail Snapper Landings (lbs gw)	SA Yellowtail Snapper Gross Revenue	Total Gross Revenue	Percent SA Yellowtail Revenue	Percent Vermilion Snapper Revenue	Percent SWG SASWG Revenue	Percent Coastal Migratory Pelagics Revenue	Percent Other Revenue
2007	472	Mean	1,292	$4,093	$30,953	26.9	4.1	15.2	27.5	26.3
		Total	609,872	$1,931,943	$14,609,842					
2008	477	Mean	1,684	$4,926	$31,782	28.1	5.3	12.5	26.5	27.7
		Total	803,347	$2,349,799	$15,160,187					
2009	474	Mean	2,356	$6,523	$33,074	28.7	4.2	10.6	28.0	28.6
		Total	1,116,593	$3,092,043	$15,676,955					
2010	457	Mean	2,012	$5,965	$32,506	26.8	5.9	10.2	30.1	26.9
		Total	919,540	$2,726,230	$14,855,288					
2011	444	Mean	2,312	$7,317	$36,431	26.1	5.6	10.2	31.8	26.3
		Total	1,026,374	$3,248,669	$16,175,441					

Source: NMFS SEFSC Coastal Fisheries Logbook and Accumulated Landings Data Base Systems, personal communication, Larry Perruso (2012).

Table 3.3.3. Average South Atlantic Yellowtail Snapper Landings, Gross Revenue, Price, and Trips by Month for Trips Harvesting South Atlantic Yellowtail Snapper, 2007-2011.

Month	SA Yellowtail Snapper Landings (lbs gw)	SA Yellowtail Snapper Gross Revenue	SA Yellowtail Snapper Price/lb	Total Gross Revenue	Number of Trips	Number of Vessels	Number of Dealers
Jan	48,773	$166,662	$3.42	$219,322	371	104	43
Feb	45,120	$157,021	$3.48	$199,714	377	103	43
Mar	57,284	$202,196	$3.53	$243,045	374	106	46
Apr	102,128	$335,486	$3.28	$374,832	478	118	47
May	114,929	$308,038	$2.68	$403,260	411	125	55
June	122,671	$291,622	$2.38	$369,013	449	122	51
July	80,080	$206,526	$2.58	$309,303	359	111	50
Aug	80,949	$235,018	$2.90	$306,811	290	94	50
Sept	77,877	$228,921	$2.94	$346,206	281	94	50
Oct	60,059	$186,287	$3.10	$277,848	256	95	49
Nov	57,443	$190,179	$3.31	$299,770	294	101	48
Dec	47,832	$161,780	$3.38	$225,484	286	99	45

Source: NMFS SEFSC Coastal Fisheries Logbook and Accumulated Landings Data Base Systems, personal communication, Larry Perruso (2012).

Based on information in **Table 3.3.4**, the average annual South Atlantic shallow water grouper (SASWG) commercial harvest in the South Atlantic over the period 2007-2011 was approximately 1.098 mp gw. SASWG includes gag, black grouper, red grouper, scamp, red hind, rock hind, yellowmouth grouper, yellowfin grouper, graysby, and coney. Landings during this time varied considerably from a high of about 1.52 million lb gw in 2007 to a low of approximately 765,300 lb gw in 2011, and thus have consistently trended downward since 2007. Most SASWG were landed in North Carolina (41%), South Carolina (39%), and East Florida (14%) from 2007 through 2011 and the vast majority (88%) are harvested using hook-and-line gear. The average ex-vessel price per pound for SASWG over this period was approximately $4.37. Although the average price was relatively stable from 2007 through 2010, it increased to $5.14 per pound in 2011, representing an increase of more than 18% from 2010. This harvest resulted in an average of approximately $4.8 million per year in gross revenue, ranging from a high of around $6.54 million in 2007 to a low of about $3.93 million in 2010 and 2011. Again, the trend is generally downward during this time, with gross revenue decreasing by approximately 40%, except that the significant increase in the average price in 2011 allowed gross revenue to remain at its 2010 level even though landings continued to decline.

Based on information in **Table 3.3.5**, the trends for gag are very similar to those for SASWG. Specifically, the average annual gag commercial harvest in the South Atlantic over the period 2007-2011 was approximately 405,254 lbs gw. Landings ranged from a high of 515,834 lb gw in 2007 to a low of 365,768 lb gw in 2011. Landings decreased significantly (25%) from 2007 through 2008, with only minor decreases occurring after 2008. Most gag were landed in South

Carolina (36%), North Carolina (33%), and East Florida (29%) from 2007 through 2011 and the vast majority (76%) were harvested using hook-and-line gear. The average ex-vessel price per pound for gag over this period was approximately $4.77. Although the average price was relatively stable between 2007 and 2010, it increased to $5.42 per pound in 2011, representing an increase of more than 17% from 2010. This harvest resulted in an average of approximately $1.93 million per year in gross revenue, ranging from a high of around $2.39 million in 2007 to a low of about $1.73 million in 2010. Again, the trend is generally downward during this time. However, even though landings decreased slightly in 2011, gross revenue increased to approximately $1.98 million due to the significant price increase.

The causes of the significant price increases for South Atlantic SASWG and gag in 2011 are not apparent and require additional research. However, one potential contributing factor could be the harvest prohibition of deepwater grouper[3] (DWG) in depths greater than 240 feet implemented under Amendment 17B (SAFMC 2010b) and which took effect in early 2011. The harvest prohibition was to reduce bycatch of speckled hind and warsaw grouper, whose harvest was completely prohibited through Amendment 17B (the regulations associated with Amendment 17B also prohibited possession and harvest of silk snapper and queen snapper in depths greater than 240 feet.) Further, if SASWG and DWG are substitute species, the decreased availability of DWG would not only be expected to increase the price of DWG but the price of SASWG too as demand for SASWG would be expected to increase. Presumably, the price increase for DWG would be greater than for SASWG. According to the information in **Table 3.3.6**, landings of DWG did in fact decrease significantly (64%) in 2011 as expected. Although the average price of DWG did increase as expected in 2011, that increase was relatively modest (5.2%) relative to the price increases for SASWG and gag. Thus, although the DWG area closure may play a role, other factors must be in play.

Another possibility is that the general demand for grouper could have increased as a result of an improvement in general economic/market conditions in 2011 relative to 2010. If that were the case, the average price of grouper in the Gulf of Mexico would also be expected to increase significantly in 2011. According to the 2011 Gulf of Mexico Grouper-Tilefish Individual Fishing Quota Annual Report (NMFS 2012), the average prices of DWG and most SWG species did increase in 2011 relative to 2010. However, with the exception of red hind, those increases were also modest (e.g., 7.2% and 3.6% for Gulf of Mexico gag and red grouper, respectively) compared to the price increases for South Atlantic SASWG and gag.[4] Thus, again, though improved economic/market conditions may also partially explain the significant price increase for South Atlantic SASWG and gag, they also do not appear to be the primary factor.

[3] For analytical purposes, deep water grouper include speckled hind, snowy grouper, yellowedge grouper, warsaw grouper, misty grouper, and queen snapper.

[4] It is also interesting that, with the exception of Gulf gag, average price for which was $4.27 and $4.58 in 2010 and 2011, respectively, the prices of all other grouper species are significantly lower in the Gulf than in the South Atlantic, contrary to expectations given that the former are managed under an IFQ program. This result may have more to do with the accuracy of prices reported to the IFQ program than real differences in the prices of Gulf and South Atlantic grouper.

Other species are harvested on trips that harvest South Atlantic SASWG. Based on information in **Table 3.3.4**, over the period 2007-2011, the average annual gross revenue from other species harvested on trips that harvest South Atlantic SASWG was approximately $5.56 million, ranging from a high of about $6.83 million in 2008 to a low of about $3.71 million in 2010, increasing to $4.38 million in 2011. A significant decline in gross revenue from these other species occurred in 2010. This decrease is entirely due to a decline in the revenue from mid-depth snapper species, most notably red snapper and vermilion snapper. The decline in red snapper revenue was due to the fishery being closed in 2010, while the commercial harvest of vermilion snapper was prohibited in 2010 after October 6 due to the commercial ACL being reached. Although the red snapper fishery continued to be closed in 2011 and thus gross revenue from red snapper continued to be basically non-existent, revenue from vermilion snapper recovered somewhat in 2011 and revenue from shallow water snapper, particularly yellowtail snapper, increased as well.

Returning to the issue of the significant price increases for SASWG and gag in 2011, red and vermilion snapper may also be substitute species. Thus, as their availability decreases, their prices and the prices of substitutes such as SASWG and gag would also be expected to decrease. However, the significant decrease in the availability of red and vermilion snapper occurred in 2010 and landings of vermilion and yellowtail snapper increased in 2011. Therefore, unless a significant lag effect exists, reasons for which are not apparent, the decreased availability of red and vermilion snapper in 2010, noting red snapper were also not available in 2011, also does not explain the significant increase in the prices of SASWG and gag in 2011.

Regardless, the average annual revenue from all species harvested on trips on which South Atlantic SASWG were harvested was approximately $10.36 million, but varied considerably during this time; specifically ranging from a high of about $13.3 million in 2007 to a low of approximately $7.64 million in 2010 (**Table 3.3.4**). Although the trend has been generally downward during this time, average annual gross revenue from all species harvested on these trips increased to $8.31 million in 2011 primarily due to the significant price increases for SASWG and gag as well as the increase in gross revenue from vermilion snapper and yellowtail snapper.

As a result, on average, gross revenue from South Atlantic SASWG contributed approximately 47% of the gross revenue from all species harvested on trips that harvested South Atlantic SASWG. This percentage varied somewhat, from a low of approximately 42% in 2009 to a high of about 52% in 2010, but with no definitive trend (**Table 3.3.4**). The majority of the average annual gross revenue from other species groups on trips harvesting South Atlantic SASWG came from mid-depth snapper (27%) and shallow water snapper (7%). Further, assuming a trip's primary target species group is represented by the species group accounting for the highest proportion of trip revenue, about 57% of the trips harvesting South Atlantic SASWG were targeting South Atlantic SASWG. The other primary target species groups on these trips were mid-depth snapper (17%) and shallow water snapper (12%). However, in 2010, SASWG was the target on about 64% of these trips, while the percentage of trips targeting both mid-depth

and shallow water snapper decreased to 11%, respectively. Given the closures for red and vermilion snapper, it is not surprising that targeting of mid-depth snapper on these trips decreased more than for shallow water snapper. Regardless, these statistics indicate that vessels are somewhat adept at targeting SASWG, and can switch targets as a result of regulations (e.g., closures), but also illustrate the multi-species nature of the snapper grouper fishery's commercial sector.

The number of trips (effort) harvesting South Atlantic SASWG averaged approximately 4,139 from 2007 through 2011. However, the number of trips decreased considerably during this time, from a high of 5,209 in 2007 to a low of 3,205 in 2010, with the number of trips basically remaining the same in 2011 as in 2010 (**Table 3.3.4**). The most significant decline occurred in 2010, which saw a decrease of more than 27%. Again, it appears this decline was caused more by the red and vermilion snapper closures than by regulations directly affecting SASWG.

SASWG gross revenue per trip averaged about $1,163 from 2007 through 2011. Because the number of trips and annual SASWG gross revenue both decreased during this time, SASWG gross revenue per trip was relatively stable with no clear trend. Total gross revenue from all species on these trips averaged $2,496 from 2007 through 2011. Like SASWG gross revenue per trip, gross revenue from all species per trip was relatively stable with no clear trend during this time.

The average number of vessels harvesting South Atlantic SASWG was 468 from 2007 through 2011, and trended similarly to the number of trips. Specifically, the number of vessels declined from a high of 542 in 2007 to a low of 381 in 2011, with the biggest decline (20.4%) occurring in 2010 for reasons previously noted (**Table 3.3.4**). Thus, on a per vessel basis, average annual gross revenue from harvests of SWG on trips harvesting SASWG was about $10,236 during this time, ranging from a high of $12,072 in 2007 to a low of $9,034 in 2009, but increasing somewhat in 2010 and 2011 due to the decline in number of vessels and increase in the average price of SWG. Total gross revenue from all species on these trips averaged about $22,000 per vessel between 2007 and 2011, decreasing from $24,540 in 2007 to $19,539 in 2010, but increasing in 2011 to $21,816.

Although the trends for SASWG gross revenue and gross revenue from all species on trips harvesting SASWG are similar, they are not identical, particularly in 2010 when SASWG gross revenue per vessel increased and gross revenue from all species per vessel decreased on trips harvesting SASWG. This difference is because, although SASWG gross revenue per trip decreased somewhat (11%), gross revenue from other species on those trips declined significantly (39%). This decrease is almost entirely due to the previously discussed decline in revenue from mid-depth snapper species, most notably red snapper and vermilion snapper.

The number of dealers purchasing South Atlantic SASWG was 201 on average during this time and has been much more stable than the number of trips or vessels, ranging from 215 in 2007 and 2008 to 186 in 2011, though a noticeable decrease from 204 to 187 dealers occurred

from 2009 to 2010 (**Table 3.3.4**). The decrease in 2010 is consistent with the declines in trips and vessels in that year.

Thus, on a per dealer basis, average annual gross revenue from harvests of SASWG on trips harvesting SASWG was about $51,000 during this time, decreasing from a high of $30,433 in 2007 to a low of $21,040 in 2010, with a minor increase in 2011 to $21,153. Total gross revenue from all species on these trips averaged $51,000 per dealer between 2007 and 2011, decreasing from $61,864 in 2007 to a low of $40,854 in 2010, with a noticeable increase in 2011 to $44,687. As with vessels, although the trends are similar for dealers, the decline in gross revenue from all species is much greater than the decline in SASWG gross revenue on these trips in 2010 for the reasons noted above.

Like trips that harvest South Atlantic SASWG, other species are harvested on trips that harvest South Atlantic gag. Based on information in **Table 3.3.5**, over the period 2007-2011, the average annual gross revenue from other species harvested on trips that harvest South Atlantic gag was approximately $4.67 million, ranging from a high of about $5.53 million in 2007 to a low of about $3.66 million in 2010, increasing to $4.09 million in 2011. Like trips that harvest South Atlantic SASWG, a significant decline in gross revenue from these other species occurred in 2010 (**Table 3.3.5**). As with SASWG trips, this decrease is almost entirely due to a decline in the gross revenue from mid-depth snapper species, particularly red snapper but also vermilion snapper to a lesser degree. The reasons for these declines have already been noted. Gross revenue from vermilion snapper recovered somewhat in 2011, which primarily led to the increase in gross revenue from other species in 2011.

The average annual revenue from all species harvested on trips on which South Atlantic gag were harvested was approximately $6.6 million, but varied considerably during this time; specifically ranging from a high of about $7.92 million in 2007 to a low of approximately $5.39 million in 2010. Although the trend has been generally downward during this time, average annual gross revenue from all species harvested on these trips increased to $6.07 million in 2011 primarily due to the significant price increases for SASWG and gag as well as the increase in gross revenue from vermilion snapper.

As a result, on average, gross revenue from South Atlantic gag contributed approximately 29% of the gross revenue from all species harvested on trips that harvested South Atlantic SASWG. This percentage varied slightly, from a low of approximately 25% in 2008 to a high of about 33% in 2011 (**Table 3.3.5**). Although this percentage decreased in 2008, it has since trended upward slightly. The majority of the average annual gross revenue from other species or species groups on trips harvesting South Atlantic gag came from mid-depth snapper (25%) and other shallow water grouper than gag (24%). Further, assuming a trip's primary target species group is represented by the species group accounting for the highest proportion of trip revenue, about 45% of the trips harvesting South Atlantic gag were targeting South Atlantic gag. The other primary target species on these trips were vermilion snapper (16%) and red grouper (12%). However, in 2010, the percentage of these trips targeting gag increased to 49%, the percentage of these trips targeting red grouper increased to 14%, while the percentage of these trips targeting

vermilion snapper decreased to 10%. This result is to be expected given the early season closure for vermilion snapper in 2010. Another shift in targeting occurred in 2011, with 51% of these trips targeting gag, only 9% targeting red grouper, and 14% targeting vermilion snapper. Again, these statistics indicate that vessels are somewhat adept at targeting gag, and can switch targets as a result of regulations (e.g., closures), but also illustrate the multi-species nature of the snapper grouper fishery's commercial sector.

The number of trips (effort) harvesting South Atlantic gag averaged approximately 2,263 from 2007 through 2011. However, the number of trips decreased during this time, from a high of 2,503 in 2007 to a low of 2,097 in 2011 (**Table 3.3.5**). The largest decline occurred in 2010, which saw a decrease of more than 10%. Again, it appears this decline was caused more by the red snapper and vermilion snapper closures than by regulations directly affecting gag. However, it is also worth noting that the decline in trips harvesting gag was not nearly as large in percentage terms as the decline in trips harvesting SASWG, and thus the red and vermilion snapper closures apparently had a greater effect on trips harvesting other SASWG species than gag.

Gag gross revenue per trip averaged about $853 from 2007 through 2011, though it varied during this time, decreasing from $956 in 2007 to $735 in 2009 and then increasing to $945 in 2011. These changes mirror changes in gag prices and trips as landings were basically stable from 2008 to 2011. Gross revenue from all species on these trips averaged $2,911 between 2007 and 2011, ranging from $3,250 in 2008 to $2,538 in 2010, but increasing to $2,894 in 2011. Changes in gross revenue from all species per trip on trips harvesting gag do not closely mirror changes in gag revenue per trip, with the exception of the simultaneous decrease in 2009 and increase in 2011. The trends differ because, while gag gross revenue fell significantly in 2008 and remained relatively stable in 2009 and 2010, gross revenue from other species on these trips changed little in 2008 but fell significantly in 2009 and again in 2010 due to declines in gross revenue from vermilion snapper and SASWG other than gag.

The average number of vessels harvesting South Atlantic gag was 273 from 2007 through 2011. Although the number of vessels trended somewhat similarly to the number of trips, the number of vessels was basically stable whereas trips increased in 2008 and 2009 (**Table 3.3.5**). More importantly, although trips declined by 10% from 2009 to 2010, the decrease in vessels was noticeably larger (17%). Specifically, the number of vessels declined from a high of 306 in 2007 to a low of 231 in 2011.

Thus, on a per vessel basis, average annual gross revenue from gag on trips harvesting gag was about $7,130 during this time, ranging from a low of $5,960 in 2009 to a high of $8,580 in 2011. Although gag gross revenue per trip declined significantly (24%) from 2007 to 2009, it subsequently increased by 44% between 2009 and 2011. This increase was partly due to the decline in trips, but the increase in the price of gag appears to have been more important. Gross revenue from all species on these trips averaged $24,173 per vessel between 2007 and 2011, decreasing from $25,880 in 2007 to $21,954 in 2009, or by 15%, but increasing to $26,272 in 2011, or by 20%. Thus, the trends for gag gross revenue and gross revenue from all species on

trips harvesting gag generally mirror each other. However, in percentage terms, the changes in gag gross revenue are greater in percentage terms than the changes in gross revenue from all species for vessels taking gag trips.

The number of dealers purchasing South Atlantic gag was 136 on average during this time and has been relatively more stable than the number of trips or vessels, ranging from 153 in 2007 to 128 in 2011, though a noticeable decrease from 153 to 137 dealers occurred from 2007 to 2008 (**Table 3.3.5**). The decrease in 2008 is consistent with the declines in gag landings, trips, and vessels in that year.

Thus, on a per dealer basis, average annual gross revenue from harvests of gag on trips harvesting gag was $14,171 during this time, ranging from a high of $15,637 in 2007 to a low of $13,119 in 2010, with a noticeable increase (18%) in 2011 to $15,483. Total gross revenue from all species on these trips averaged $48,411 per dealer between 2007 and 2011, ranging from a high of $52,729 in 2008 to a low of $40,841 in 2010. A noticeable decrease of 17% in 2010 was followed by a noticeable increase (16%) in 2011. The trends in gag gross revenue and gross revenue from all species do not generally mirror each other for dealers because gross revenue from other species decreased significantly in 2009 and particularly in 2010. As previously discussed, the difference in trends is caused by the fact that gross revenue from other species on these trips changed little in 2008 but fell significantly in 2009 and again in 2010 due to declines in gross revenue from vermilion snapper and SASWG other than gag.

Given the information on the SASWG and gag components of the snapper grouper fishery's commercial sector, noting that gag is part of the SASWG complex, it is clear these components of the fishery have been noticeably if not highly unstable from 2007 to 2011. In addition to the previously discussed red snapper and vermilion snapper closures, and the DWG harvest prohibition which was subsequently eliminated, the spawning season closure for gag was extended in 2010 from March-April to January-April and a 1,000 lb trip limit was implemented in mid-2011. Economic and market factors also appear to have played a role, particularly with respect to changes in the price of SASWG and gag in 2011. Thus, as of 2011, these components of the fishery bear little resemblance to what they were in 2007-2009, while 2010 appears to have been a "transition year" during which many of these changes occurred or were just starting to take effect and vessel owners were adjusting to those changes. As such, in terms of vessel behavior and the outcomes of that behavior (e.g., participation, landings, gross revenue, etc.), information for years previous to 2011 is probably irrelevant with respect to evaluating the expected effects of additional management measures. Thus, the following description of vessels' gross revenue portfolios for the commercial SASWG and gag components of the snapper grouper fishery only examines information from 2011.

Based on the information in **Table 3.3.7**, vessels harvesting SASWG also take trips on which no SASWG are harvested. The landings and gross revenue associated with these trips constitute a substantial amount of the gross revenue for these vessels. Although harvests of SASWG accounted for about half (47%) of the gross revenue on trips that harvested SASWG in 2011, they represented a much smaller percentage (26%) of these vessels' total annual gross revenue.

These vessels are also relatively dependent on gross revenue from shallow water snapper (23%), coastal migratory pelagics (17%), mid-depth snapper (10%), and jacks (7%), with grunts/porgies (3%) and other species (12%) accounting for the rest of their gross revenue. This information indicates that South Atlantic SWG vessels' operations are not only multi-species in nature, but multi-fishery in nature as well. These results are not intended to suggest that none of these vessels are highly dependent on gross revenue from SASWG. However, gross revenue from SASWG harvests represented 50% or more of total annual gross revenue for only 78 of the 381 vessels.

Similarly, based on the information in **Table 3.3.8**, vessels harvesting South Atlantic gag also take trips on which no South Atlantic gag are harvested. The landings and gross revenue associated with these trips constitute a substantial amount of the gross revenue for these vessels. Although harvests of South Atlantic gag account for about one third (33%) of the gross revenue on trips that harvest South Atlantic gag, they represented a smaller percentage of these vessels' total annual gross revenue on average (21%). These vessels are also relatively dependent on gross revenue from coastal migratory pelagics (18%), other shallow water grouper (14%), shallow water snapper (14%), jacks (8%), and mid-depth snapper (6%), with other species accounting for the other 20%. This information indicates that South Atlantic gag vessels' operations are not only multi-species in nature, but multi-fishery in nature as well. These results are not intended to suggest that none of these vessels are highly dependent on gross revenue from South Atlantic gag. However, gross revenue from South Atlantic gag harvests represented 50% or more of total annual gross revenue for only 27 of the 231 vessels.

Table 3.3.4. Landings, Gross Revenue, Trips, Vessels, and Dealers by Year on South Atlantic Shallow Water Grouper (SWG) Trips, 2007-2011.

Year	SA SWG Landings (lbs gw)	Average SWG Price	SA SWG Gross Revenue	Other Species Gross Revenue	Total Gross Revenue	Percent SASWG Revenue	Number of Trips	Number of Vessels	Number of Dealers
2007	1,521,159	$4.30	$6,543,000	$6,757,655	$13,300,655	49.2	5,209	542	215
2008	1,245,283	$4.15	$5,162,106	$6,830,382	$11,992,488	43.0	4,604	533	215
2009	1,050,305	$4.22	$4,435,634	$6,123,437	$10,559,071	42.0	4,414	491	204
2010	906,615	$4.34	$3,934,462	$3,705,245	$7,639,707	51.5	3,205	391	187
2011	765,302	$5.14	$3,934,443	$4,377,316	$8,311,760	47.3	3,265	381	186

Source: NMFS SEFSC Coastal Fisheries Logbook and Accumulated Landings Data Base Systems, personal communication, Larry Perruso (2012).

Table 3.3.5. Landings, Gross Revenue, Trips, Vessels, and Dealers by Year on South Atlantic Gag Trips, 2007-2011.

Year	SA Gag Landings (lbs gw)	Average Gag Price	SA Gag Gross Revenue	Other Species Gross Revenue	Total Gross Revenue	Percent Gag Revenue	Number of Trips	Number of Vessels	Number of Dealers
2007	515,834	$4.64	$2,392,510	$5,526,777	$7,919,288	30.2	2,503	306	153
2008	387,120	$4.68	$1,812,414	$5,411,396	$7,223,810	25.1	2,223	294	137
2009	382,373	$4.55	$1,740,427	$4,670,201	$6,410,628	27.1	2,367	292	130
2010	375,177	$4.62	$1,731,663	$3,659,331	$5,390,994	32.1	2,124	243	132
2011	365,768	$5.42	$1,981,867	$4,087,071	$6,068,938	32.7	2,097	231	128

Source: NMFS SEFSC Coastal Fisheries Logbook and Accumulated Landings Data Base Systems, personal communication, Larry Perruso (2012).

Table 3.3.6. Landings and Revenue of South Atlantic Deep Water Grouper (DWG), 2007-2011.

Year	SA DWG Landings (lbs gw)	Average DWG Price	SA DWG Gross Revenue
2007	125,306	$3.89	$487,564
2008	93,582	$3.73	$348,838
2009	93,795	$3.65	$342,153
2010	112,856	$3.84	$433,136
2011	40,945	$4.04	$165,509

Source: NMFS SEFSC Coastal Fisheries Logbook and Accumulated Landings Data Base Systems, personal communication, Larry Perruso (2012).

Table 3.3.7. Landings and Revenue Statistics for Vessels Harvesting South Atlantic SWG in 2011.

Number of Vessels	Statistic	SASWG Landings (lbs gw)	SASWG Gross Revenue	Total Gross Revenue	Percent SA SWG Revenue	Percent Shallow Water Snapper Revenue	Percent Mid-Depth Snapper Revenue	Percent Coastal Migratory Pelagics Revenue	Percent Jacks Revenue	Percent Grunt/Porgy Revenue	Percent Other Revenue
381	Mean	2,009	$10,327	$43,825	26.2	23.2	10.2	17.7	7.0	3.0	12.1
	Total	765,302	$3,934,443	$16,697,402							

Source: NMFS SEFSC Coastal Fisheries Logbook and Accumulated Landings Data Base Systems, personal communication, Larry Perruso (2012).

Table 3.3.8. Landings and Revenue Statistics for Vessels Harvesting South Atlantic Gag in 2011.

Number of Vessels	Statistic	SA Gag Landings (lbs gw)	SA Gag Gross Revenue	Total Gross Revenue	Percent SA Gag Revenue	Percent Non-Gag SWG Revenue	Percent Shallow Water Snapper Revenue	Percent Mid-Depth Snapper Revenue	Percent Coastal Migratory Pelagics Revenue	Percent Jacks Revenue	Percent Other Revenue
231	Mean	1,583	$8,580	$51,540	20.9	13.7	14.1	6.1	17.8	7.7	19.7
	Total	365,768	$1,981,867	$11,905,749							

Source: NMFS SEFSC Coastal Fisheries Logbook and Accumulated Landings Data Base Systems, personal communication, Larry Perruso (2012).

Estimates of the economic impacts (business activity) associated with the commercial snapper grouper fishery are derived using the model developed for and applied in USDOC (2009). Based on the average annual gross revenue for all snapper grouper species over the period 2007-2011 of $13.66 million, the commercial snapper grouper fishery is estimated to support 2,575 full time equivalent (FTE) jobs and generate approximately $77 million in income impacts and $180 million in output (sales) impacts per year to the U.S. economy. Among the jobs supported, 336 FTE jobs are estimated to be in the harvesting sector and 205 FTE jobs are in the dealer/processor sector. Approximately two-thirds of the jobs supported by the commercial snapper grouper fishery are estimated to accrue to the restaurant sector. The estimates of economic activity include the direct effects (effects in the sector where an expenditure is actually made), indirect effects (effects in sectors providing goods and services to directly affected sectors), and induced effects (effects induced by the personal consumption expenditures of employees in the direct and indirectly affected sectors).

The commercial economic impacts associated with the harvesting of only yellowtail snapper by South Atlantic commercial fishermen and the activities of the seafood and retail industries that depend on fish and seafood products also can be estimated. It is important to keep in mind that these impacts are a component of the snapper grouper impacts discussed above and thus are not additive to those impacts. These economic impacts are expressed in terms of employment (full-time and part-time jobs), personal income, and output (sales by U.S. businesses). Using the average gross revenue of approximately $2.7 million (2008 dollars) from 2007 to 2011, the harvesting sector accounted for 66 jobs, $2.2 million in income, and $5.72 million in output. When harvester data are combined with all aspects of the seafood industry (retail, restaurants, etc.) related to South Atlantic yellowtail snapper harvest, the values increase to 503 jobs, $14.98 million in income, and $35.15 million in output.

The commercial economic impacts associated with the harvesting of only SASWG by South Atlantic commercial fishermen and the activities of the seafood and retail industries that depend on fish and seafood products also can be estimated. It is important to keep in mind that these impacts are a component of the snapper grouper impacts discussed above and thus are not additive to those impacts. These economic impacts are expressed in terms of employment (full-time and part-time jobs), personal income, and output (sales by U.S. businesses). Given the previous discussion regarding changes in the commercial sector from 2007 to 2011, only 2011 data are used to estimate the economic impacts of commercial SWG harvests. Using the gross revenue of $4,111,493 (2008 dollars) from 2011, the harvesting sector accounted for 101 jobs, $3.39 million in income, and $8.81 million in output. When harvester data are combined with all aspects of the seafood industry (retail, restaurants, etc.) related to South Atlantic SWG harvest, the values increase to 775 jobs, $23.07 million in income, and $54.13 million in output.

The commercial economic impacts associated with the harvesting of only gag by South Atlantic commercial fishermen and the activities of the seafood and retail industries that depend on fish and seafood products also can be estimated. It is important to keep in mind that these impacts are a component of the snapper grouper impacts discussed above and thus are not additive to those impacts. These economic impacts are expressed in terms of employment (full-time and part-time jobs), personal income, and output (sales by U.S. businesses). Again, given the previous discussion regarding changes in the commercial sector from 2007 to 2011, only 2011 data are used to estimate the economic impacts of commercial SASWG harvests. Using the gross revenue of $2,071,051 (2008 dollars) from 2011, the harvesting sector accounted for 31 jobs, $1.44 million in income, and $4.47 million in output. When harvester data are combined with all aspects of the seafood industry (retail, restaurants, etc.) related to

South Atlantic gag harvest, the values increase to 390 jobs, $11.62 million in income, and $27.27 million in output.

In 2003-2007, commercial snapper grouper permits averaged 944, of which 749 were transferable and 195 were non-transferable. Transferable permits have no harvest limit per trip, except for species subject to trip limits while non-transferable permits are restricted to 225 lbs of harvest per trip. The comparable numbers for 2008-2010 were 788 total permits, of which 643 were transferable permits and 145 non-transferable permits. According to the Southeast Regional Office Website, the Constituency Services Branch (Permits) unofficially listed 690 current holders of commercial snapper grouper permits as of October 30, 2012. Of these permits, 563 are transferable and 127 are non-transferable.

Imports continue to be a major source of seafood supply in the United States. Yellowtail snapper specifically is not imported, but is comparable and marketed as a general "snapper" and is a substitute for other snapper grouper species. NMFS purchases fisheries trade data from the Foreign Trade Division of the U.S. Census Bureau. The list of product codes relevant to this data request includes fresh and frozen snappers and groupers. Data are available for download at http://www.st.nmfs.noaa.gov/st1/trade/index.html.

During 2007-2011, imports of fresh and frozen snappers and groupers averaged 43.4 mp (product weight), valued at $104 million. The dominance of imports in the total snapper grouper market would be expected to exert limits on the movement of domestic ex-vessel prices resulting from changes in domestic landings. However, as previously noted, landings and ex-vessel prices for yellowtail snapper show a strong inverse relationship and thus fresh local product may benefit from higher prices in local markets.

3.3.1.2 Economic Description of the Recreational Sector

A description of the recreational component of the snapper grouper fishery is contained in the Comprehensive ACL Amendment (SAFMC 2011c) and Snapper Grouper Regulatory Amendment 10 (SAFMC 2010c) and is incorporated herein by reference. The following is a brief summary and updated information, where available.

Amendment 17B (SAFMC 2010b) reported that recreational snapper grouper landings in the South Atlantic averaged approximately 10.8 mp per year during 2005-2009. Private boat anglers accounted for the largest landings, accounting for approximately 6.1 mp, followed by shore anglers (1.7 mp), charter anglers (1.6 mp), and headboat anglers (1.4 mp). In 2010-2011, recreational snapper grouper landings averaged approximately 11.8 mp annually, with 6.7 mp contributed by the private mode, 2.7 mp by the shore mode, 1.2 mp by the charter mode and 1.2 mp by headboats.

As in the commercial sector, more than 99% of yellowtail snapper recreationally harvested in the South Atlantic occurred in waters off Florida. In the aggregate, recreational yellowtail snapper landings averaged 541,301 pounds (ww) from 2007 through 2011 (**Table 3.3.9**), but have generally been trending downward, decreasing significantly in 2009 (53%) before increasing in 2010 and then decreasing again in 2011.

Recreational landings of yellowtail snapper also varied across the various fishing modes during 2007-2011 (**Table 3.3.9**). Charterboat landings followed the same pattern as total recreational landings and accounted for about 24% of total recreational landings. Headboat landings accounted for about 15% of total recreational landings and were far more stable during this time, but also decreased in 2009. The private/rental mode was by far the dominant sector with respect to landings of yellowtail snapper, accounting for approximately 60% of the total recreational landings. As such, private/rental landings followed the same pattern as total recreational landings from 2007 to 2011, though the decrease in 2009 was even more pronounced (66%). Finally, the shore mode is relatively unimportant, accounting for only 1% of total recreational landings, but also experienced a noticeable decline in 2009 before declining to zero in 2011.[5]

Table 3.3.9. Landings (pounds whole weight) of yellowtail snapper in the South Atlantic by mode, 2007-2011.

	2007	2008	2009	2010	2011	Average
Charter	179,985	125,889	97,299	138,801	115,057	131,406
Headboat	81,889	91,142	75,073	85,552	85,024	83,736
Private/Rental	515,494	521,504	174,821	208,675	190,916	322,282
Shore	9,031	7,778	1,343	1,231	0	3,877
Total	786,399	746,313	348,536	434,259	390,998	541,301
Average	196,600	186,578	87,134	108,565	97,749	135,325

Source: SERO-Annual Catch Limits dataset, November 19, 2012.

As illustrated in **Table 3.3.10**, recreational landings of South Atlantic yellowtail snapper are highly seasonal and follow a pattern similar though not identical to that of commercial landings. For the recreational sector, peak landings typically occur in May-June (wave 3) and July-August (wave 4), as is the case for the commercial sector. Recreational landings are typically lowest in September-October (wave 5) and January-February (wave 1), though they have also been low in November-December (wave 6) the last few years, somewhat similar to commercial landings, which are lowest in the winter (December through February).

Table 3.3.10. Average landings (pounds whole weight) of yellowtail snapper in the South Atlantic, by wave, 2007-2011.

Year	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Total
2007	100,821	81,060	201,710	196,924	104,350	101,535	786,399
2008	79,035	166,574	133,951	198,985	57,979	109,789	746,313
2009	49,074	48,357	90,007	70,209	33,019	57,870	348,536
2010	30,595	56,860	130,779	123,911	52,135	39,980	434,259
2011	63,050	81,870	63,786	68,236	64,701	49,355	390,998
Total	322,574	434,720	620,233	658,265	312,184	358,529	2,706,505
Average	64,515	86,944	124,047	131,653	62,437	71,706	541,301

Source: SERO-Annual Catch Limits dataset, November 19, 2012.

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

[5] Zero landings by the shore mode in 2011 does not imply that catch was zero; only that all the catch was discarded.

1. Target effort - The number of individual angler trips, regardless of duration, where the intercepted angler indicated that the species or a species in the species group was targeted as either the first or the second primary target for the trip. The species did not have to be caught.
2. Catch effort - The number of individual angler trips, regardless of duration and target intent, where the individual species or a species in the species group was caught. The fish did not have to be kept.[6]
3. Total recreational trips - The total estimated number of recreational trips in the South Atlantic, regardless of target intent or catch success.

Amendment 17B (SAFMC 2010b) reported that, over the years 2005-2009, an average of approximately 945,000 individual angler trips per year targeted snapper grouper species across all modes and states in the South Atlantic, or approximately 4% of all recreational shore, charter, and private angler trips. Snapper grouper target effort was highest in Florida, approximately 694,000 trips per year, and in the private mode, approximately 626,000 trips per year. In 2010-2011, total angler target trips for snapper grouper dropped to about 826,000 per year. This still comprised about 4% of all recreational shore, charter, and private angler trips. Florida accounted for the highest number of target trips at about 579,000 trips and the private mode accounted for the highest number of target trips at 592,000 trips. For the most recent five years (2007-2011), total target effort for snapper grouper in the South Atlantic averaged 906,106 trips annually.

Substantially more recreational trips catch snapper grouper species than target these species. Amendment 17A (SAFMC 2010a) reported that during 2003-2008 an average of approximately 3.5 million individual angler trips in just the shore, private boat, and charter modes caught snapper grouper each year. Over 80% if these trips occurred off Florida. In 2009-2011, an average of about 2.8 million angler trips with the shore, private, and charter modes caught snapper grouper, with about 76% occurring off Florida. In 2005-2009, recreational catch effort for snapper grouper in the South Atlantic averaged approximately 2.7 million trips per year. The corresponding average catch effort for the most recent five years (2007-2011) is 3.3 million trips per year.

For yellowtail snapper, estimates of catch effort by mode are presented in **Table 3.3.11** while those for target effort by mode are shown in **Table 3.3.12**. The private/rental mode is by far the dominant sector in terms of catch and target trips for yellowtail snapper. Also apparent in these tables is the substantial difference between target and catch trips, with target trips being generally less than 20% of catch trips. While many angler trips recorded landings of yellowtail snapper, many fewer angler trips recorded this species as the target species. Like recreational landings, more than 99% of catch trips occur in waters off Florida while all target trips occur in waters off Florida.

[6] If an angler discards all fish caught on a particular trip, landings would be zero.

Table 3.3.11. Catch trips for yellowtail snapper in the South Atlantic, by mode, 2007-2011.

	2007	2008	2009	2010	2011	Average
Shore	26,300	39,388	36,499	6,295	5,394	22,775
Charter	26,365	16,129	21,870	18,360	14,523	19,449
Private/Rental	192,383	161,893	116,322	109,443	74,642	130,937

Source: SERO-MRFSS/MRIP data.

Table 3.3.12. Target trips for yellowtail snapper in the South Atlantic, by mode, 2007-2011.

	2007	2008	2009	2010	2011	Average
Shore	1,521	18,587	858	0	0	4,193
Charter	0	2,289	1,384	639	0	862
Private/Rental	38,734	41,202	15,699	16,510	13,964	25,222

Source: SERO-MRFSS/MRIP data.

According to the information in **Table 3.3.13**, the seasonal distribution of catch and target trips for yellowtail snapper mimics that of recreational landings. That is, catch trips and target trips peak in May-June (wave 3) and are at their lowest level in March-April (wave 2).

Table 3.3.13. Average catch and target trips for yellowtail snapper in the South Atlantic, by wave, 2007-2011.

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6
Catch Trips	19,654	15,236	40,902	39,835	31,717	25,818
Target Trips	3,951	2,157	9,724	7,791	4,320	2,335

Source: SERO-MRFSS/MRIP data.

Similar analysis of recreational effort is not possible for the headboat sector because headboat data are not collected at the angler level. Estimates of effort in the headboat sector are provided in terms of angler days, or the number of standardized 12-hour fishing days that account for the different half-, three-quarter-, and full-day fishing trips by headboats. Despite the inability to associate headboat effort with specific species, the stationary bottom nature of headboat fishing, as opposed to trolling, suggests that most headboat trips and, hence, angler days, are snapper grouper trips by intent. Amendment 17B (SAFMC 2010b) reported that over the years 2005-2009, an average of approximately 225,000 angler trips were taken each year in the South Atlantic. The majority of these trips, approximately 153,000 trips per year, were taken in Georgia-Florida (Georgia is combined with Florida because of confidentiality considerations). In 2010-2011, anglers in the South Atlantic took an average of 188,000 trips. Georgia-Florida, with an average of about 144,000 trips, accounted for most of the trips.

Amendment 17A (SAFMC 2010a) reported an average of 1,811 snapper grouper for-hire permits in the South Atlantic for the period 2003-2008. In 2009-2010, South Atlantic snapper grouper for-hire permits averaged 1,953. In both periods, most permit holders listed Florida as their homeport state. For-hire permits do not distinguish charterboats from headboats. Based on a 1997 survey, Holland et al. (1999) estimated that a total of 1,080 charter vessels and 96 headboats supplied for-hire services in all South Atlantic fisheries during 1997. By 2010, the estimated number of headboats supplying for-hire services in all South Atlantic fisheries had fallen to 85, indicating a decrease in fleet size of approximately

11% between 1997 and 2010 (K. Brennan, Beaufort Laboratory, Southeast Fisheries Science Center (SEFSC), personal communication, Feb. 2011). According to the Southeast Regional Office Website, the Constituency Services Branch (Permits) unofficially listed 1,509 current holders of South Atlantic for-hire snapper grouper permits as of October 30, 2012.

Participation, effort, and landings are indicators of the value of saltwater recreational fishing. However, a more specific indicator of value is the satisfaction that anglers experience over and above their costs of fishing. The monetary value of this satisfaction is referred to as consumer surplus. The value or benefit derived from the recreational experience is dependent on several quality determinants, which include fish size, catch success rate, and the number of fish kept. These variables help determine the value of a fishing trip and influence total demand for recreational fishing trips.

Amendments 17A (SAFMC 2010a) and 17B (SAFMC 2010b) contain discussions on estimates of the consumer surplus (CS) associated with fishing for snapper grouper derived from different studies, including Haab *et al.* (2009), Dumas *et al.* (2009), and NMFS (2009). The estimated CS per snapper grouper (individual fish) used in the analysis of the expected effects of the management changes proposed in Amendment 17A was $80 in 2009 dollars, or $82.64 in 2011 dollars. More recently, Carter and Liese (2012) estimated CS values for various species. However, yellowtail snapper was not one of those species. In the Comprehensive ACL Amendment (SAFMC 2011c) an estimate for yellowtail snapper was generated, but on a per pound basis. This estimate was specifically developed for use when management measures changed the recreational ACL, which is typically measured in pounds. That estimate was $10.93 per pound in 2009 dollars, which is $11.42 in 2011 dollars.

While anglers receive economic value as measured by the consumer surplus associated with fishing, for-hire businesses receive value from the services they provide. Producer surplus is the measure of the economic value these operations receive. Producer surplus is the difference between the revenue a business receives for a good or service, such as a charter or headboat trip, and the cost the business incurs to provide that good or service. Estimates of the producer surplus associated with for-hire trips are not available. However, proxy values in the form of net operating revenue are available (David Carter, NMFS SEFSC, personal communication, August 2010). These estimates were culled from several studies – Liese et al. (2009), Dumas et al. (2009), Holland et al. (1999), and Sutton et al. (1999). Amendment 17A utilized a value of $128 (2009 dollars), or $132 in 2011 dollars, per charter angler trip to assess the expected change in net operating revenue of the proposed management changes on charter vessels. Since NOR from the harvest of a particular species is only attributed to trips targeting that species, NOR per year from trips targeting yellowtail snapper is estimated to have been approximately $113,800 on average for charter vessels between 2007 and 2011. In a more recent study, Holland et al. (2012) reported that charter vessels in the South Atlantic had average revenue of approximately $106,000 per vessel in 2009.

Net operating revenue per angler trip is lower for headboats than for charterboats. Net operating revenue estimates for a representative headboat trip are $48 in the Gulf of Mexico (all states and all of Florida), and $63-$68 in North Carolina. For full-day and overnight headboat trips, net operating revenue are estimated to be $74-$77 in North Carolina. Comparable estimates are not available for Georgia and South Carolina. Amendment 17A (SAFMC 2010a) utilized a value of $68 (2009 dollars) per headboat angler trip to assess the expected change in net operating revenue of the proposed management changes on headboat vessels. Since target effort by headboat vessels cannot be estimated for specific species, NOR from trips targeting yellowtail snapper cannot be estimated for headboat vessels. Holland et al. (2012) reported that headboats in the South Atlantic had average revenue of approximately $188,000 per

vessel in 2009. Holland et al. also report that, in 2009, no charter vessels earned more than $500,000 in gross revenues.

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

Estimates of the economic impacts (business activity) associated with the recreational snapper grouper fishery were derived using average output (sales) and job (FTE) impact coefficients for recreational angling across all fisheries (species), as derived by an economic add-on to the Marine Recreational Fisheries Statistical Survey (MRFSS), and described and utilized in USDOC (2009). Estimates of the average expenditures by recreational anglers are provided in USDOC (2009) and are incorporated herein by reference. Estimates of the average yellowtail snapper effort (2007-2011) and associated business activity (2008 dollars) are provided in **Table 3.3.14**. Yellowtail snapper target trips were selected as the measure of effort. Consistent with the distribution of target effort, all business activity associated with yellowtail snapper fishing occurs in Florida (across all modes), and the contributions by private/rental mode anglers were the greatest. It should be noted that output impacts and value added impacts are not additive.

As noted in the previous paragraph, the values provided in **Table 3.3.14** reflect only effort derived from the MRFSS/MRIP. Because the headboat sector in the Southeast is not covered in the MRFSS, the results in **Table 3.3.14** do not include estimates of the business activity associated with headboat anglers. Although estimates of the business activity associated with the headboat sector were provided in Amendment 17A, these estimates were based on the model parameters appropriate for the charterboat sector, which are higher than would be expected for the headboat sector because of higher fees charged by charter vessels and other factors discussed in Amendment 17A. As a result, these estimates are not repeated here and updated. More appropriate estimates of the business activity associated with the headboat component of the snapper grouper fishery are not available.

Table 3.3.14. Summary of yellowtail snapper target trips (2007-2011) and associated economic impacts (2008 dollars).
Output and value added impacts are not additive.

	North Carolina	South Carolina	Georgia	Florida
	Shore Mode			
Target Trips	0	0	0	4,193
Output Impact	$0	$0	$0	$119,784
Value Added Impact	$0	$0	$0	$69,541
Jobs	0	0	0	1
	Private/Rental Mode			
Target Trips	0	0	0	25,222
Output Impact	$0	$0	$0	$953,774
Value Added Impact	$0	$0	$0	$569,930
Jobs	0	0	0	10
	Charter Mode			
Target Trips	0	0	0	862
Output Impact	$0	$0	$0	$337,819
Value Added Impact	$0	$0	$0	$198,884
Jobs	0	0	0	3
	All Modes			
Target Trips	0	0	0	30,277
Output Impact	$0	$0	$0	$1,411,377
Value Added Impact	$0	$0	$0	$838,355
Jobs	0	0	0	15

Source: effort data from the MRFSS/MRIP database (SERO). Economic impact results calculated by NMFS SERO using the model developed for USDOC (2009).

3.3.2 Social Environment

Descriptions of the social and cultural environment of the snapper grouper fishery are contained in Jepson et al. (2005), Amendment 17A (SAFMC 2010a), and the Comprehensive ACL Amendment (SAFMC 2011c) and are incorporated herein by reference.

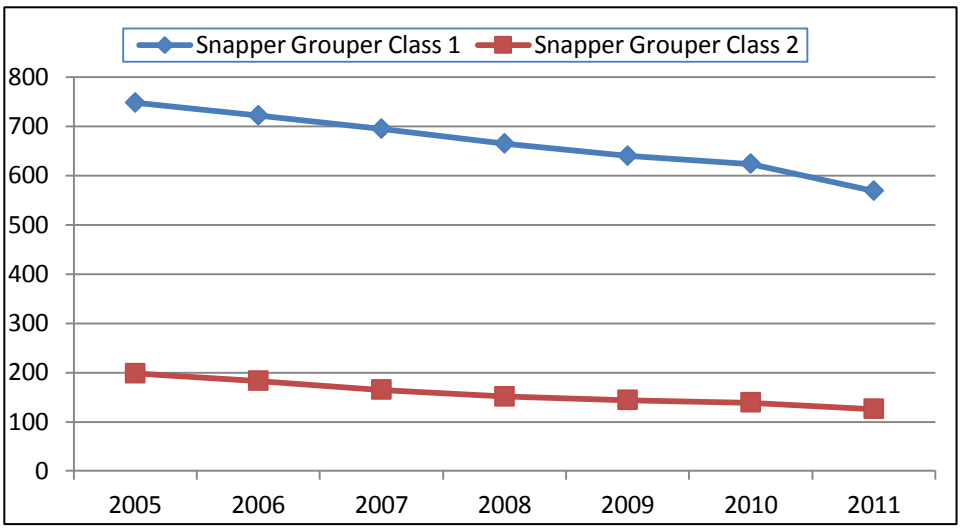

Figure 3.3.1. Snapper grouper class 1 (unlimited) and class 2 (225-Pound trip limit) permits 2005-2011. Source: Permits Database, NMFS SERO (2011).

Since 2005, South Atlantic Snapper Grouper Unlimited Permits (class 1) and Snapper Grouper 225-pound Trip Limit Permits (class 2) have shown a downward trend (**Figure 3.3.1**). With a limited entry program in place since 1998 and a "2 for 1" requirement, a reduction in permits would be expected over time and will likely continue as long as the criteria are a continued part of management. More in-depth descriptions of many of the communities included in the figures below can be found in Jepson et al. (2005) and Amendment 17A (SAFMC 2010a).

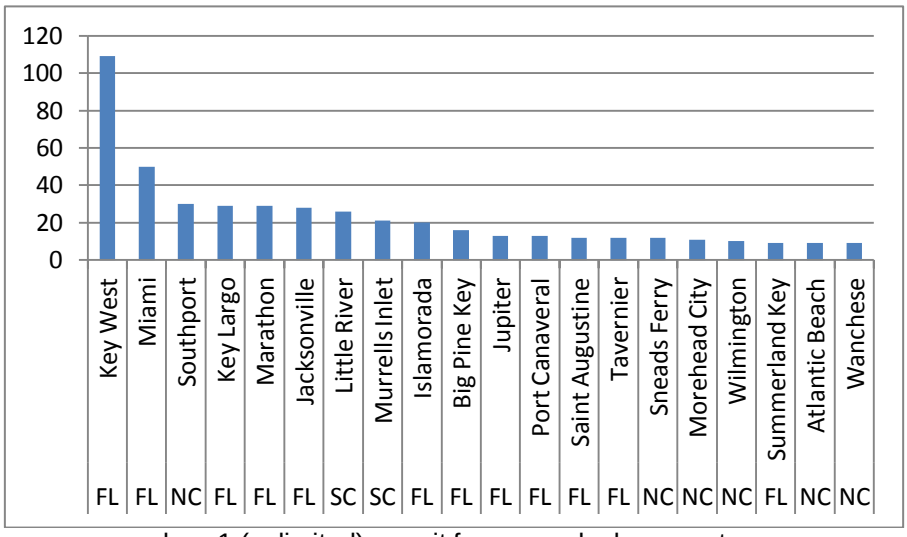

Figure 3.3.2. Snapper grouper class 1 (unlimited) permit frequency by homeport.
Source: Permits Database, NMFS SERO (2011).

Florida communities have the majority of snapper grouper class 1 permits with communities of Southport, North Carolina, and Little River and Murrells Inlet, South Carolina, within the top ten communities with class 1 permits **(Figure 3.3.2)**. Florida also dominates class 2 permits with only Frisco and Southport, North Carolina, the only two communities outside of the state listed in the top twenty communities with class 2 permits **(Figure 3.3.3)**.

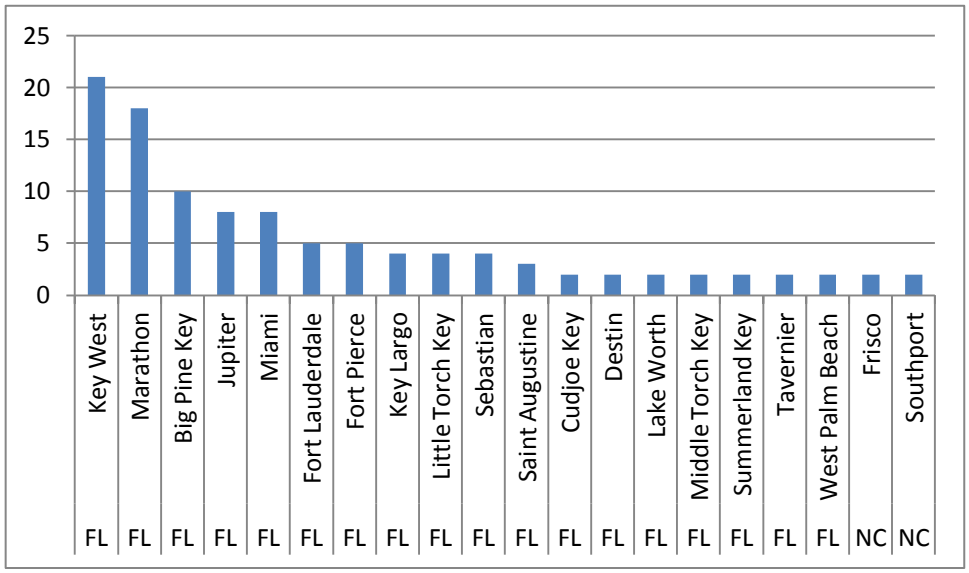

Figure 3.3.3. Snapper grouper class 2 (225-Pound trip limit) permits frequency by homeport
Source: Permits Database, NMFS SERO (2011).

Communities with substantial landings of snapper grouper species were identified in Amendment 17A (SAFMC 2010a) and the Comprehensive ACL Amendment (SAFMC 2011c) with demographic descriptions for many of those communities. **Figure 3.3.4** below provides a depiction of yellowtail snapper regional quotient landings and value for the top ten South Atlantic communities with yellowtail landings. A regional quotient (RQ) is the amount of local landings and/or value divided by the total

landings and value for the region. For this analysis, landings for Florida Keys communities were included in the South Atlantic region as we are unable to disaggregate landings at the community level to Gulf or Atlantic at this time. Actual values of quotients for pounds and value of landings are not reported on the y axis to address confidentiality concerns. Still, **Figure 3.3.4** provides an indication of the proportion of yellowtail snapper that is landed out of the regional total by these top ten communities.

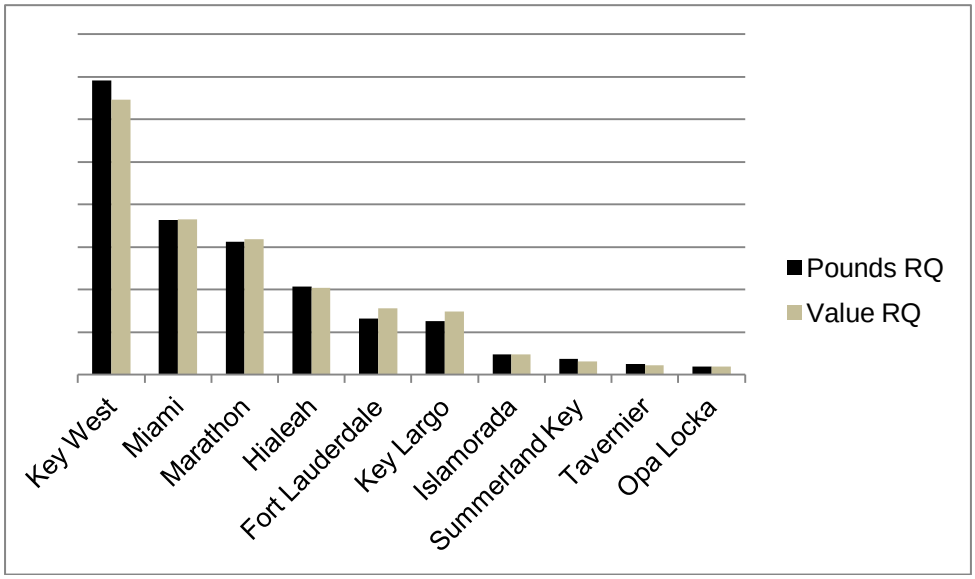

Figure 3.3.4. South Atlantic communities ranked by regional quotient of weight and value of yellowtail snapper landings
Source: Accumulative Landings System (2011).

As seen in **Figure 3.3.4**, all South Atlantic fishing communities with over 5% regional quotient of weight and value of yellowtail snapper are located in Florida. All other communities were below 5% of regional quotient with most below 1%. Using the top ten communities with the most regional quotient, a comparison of two indices recently developed to understand both dependence on commercial and recreational fishing and overall community well being will be presented below (data were not available for Summerland Key).

To better understand how South Atlantic yellowtail snapper fishing communities are engaged and reliant on fishing, indices were created using secondary data from permit and landings information for the commercial and recreational sector (Colburn and Jepson 2012; Jacob et al. 2012). Fishing engagement is primarily the absolute numbers of permits, landings, and value. Fishing reliance has many of the same variables as engagement divided by population to give an indication of the per capita impact of this activity.

Using a principal component and single solution factor analysis, each community receives a factor score for each index to compare to other communities. Taking the ten communities in **Figure 3.3.5**, factor scores of both engagement and reliance for both commercial and recreational fishing were plotted onto radar graphs. Each community's factor score is located on the axis radiating out from the center of the graph to its name. Factor scores are connected by colored lines and are standardized; therefore, the mean is zero. Two thresholds of one and one-half standard deviations above the mean are plotted onto the

graphs to help determine a threshold for significance. Because the factor scores are standardized a score above 1 is also above one standard deviation.

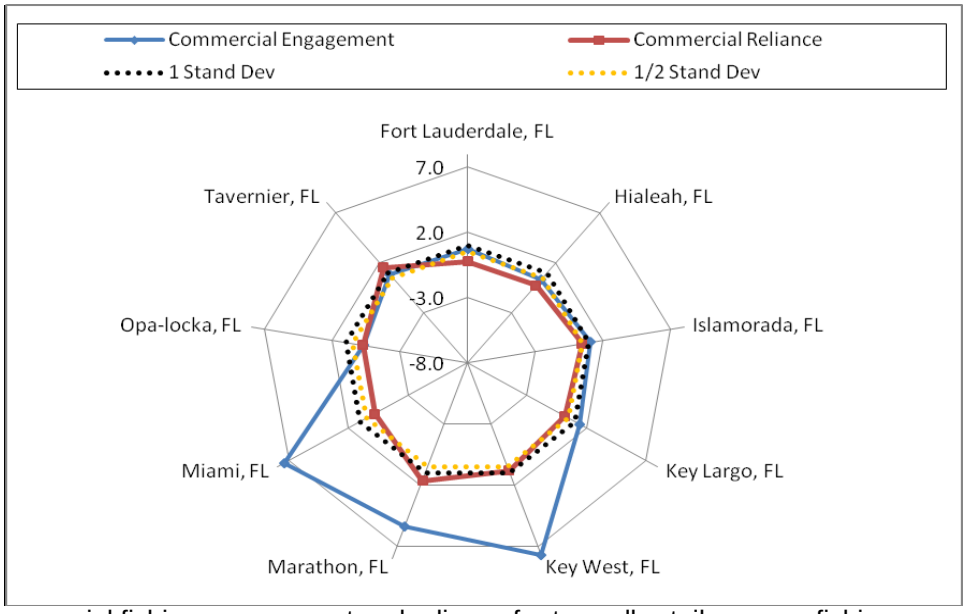

Figure 3.3.5. Commercial fishing engagement and reliance for top yellowtail snapper fishing communities
Source: Social Indicators Database NMFS SERO (2012).

Using the two thresholds of fishing dependence of half and one standard deviation, **Figure 3.3.5** suggests that several communities are substantially engaged in commercial fishing. The communities of Islamorada, Key Largo, Key West, Miami, and Marathon all exhibit commercial engagement index scores above the one standard deviation, with all communities, except Opa-locka and Hialeah, above ½ standard deviation. With regard to commercial reliance, only Tavernier and Marathon have index scores above one standard deviation and Key West an index score above half a standard deviation. For those communities that exceed the engagement and reliance thresholds of 1 or one-half standard deviations, they would be more dependent upon commercial fishing among those communities evaluated.

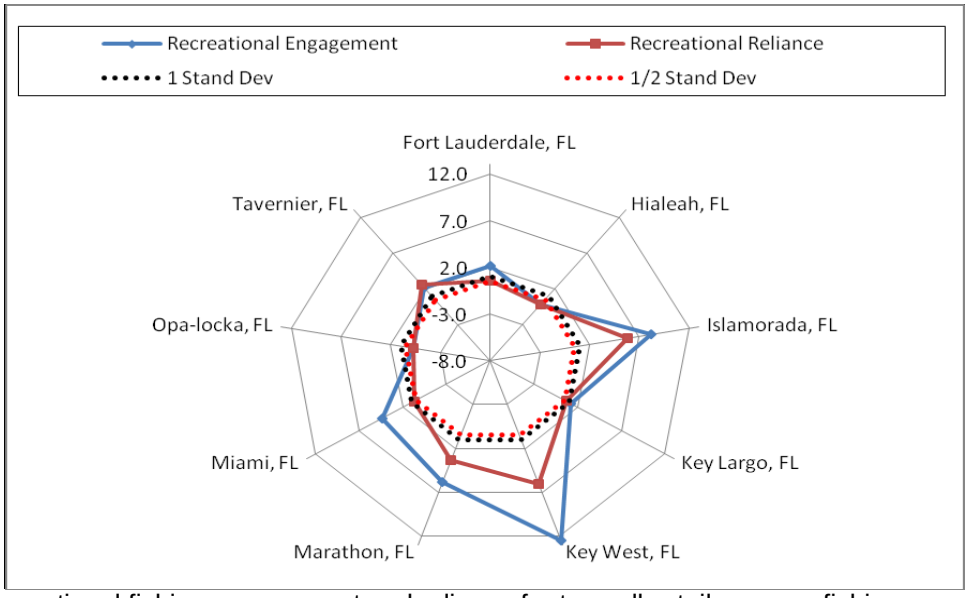

Figure 3.3.6. Recreational fishing engagement and reliance for top yellowtail snapper fishing communities
Source: Social Indicators Database NMFS SERO (2012)

Using the same thresholds, recreational engagement and reliance are plotted in **Figure 3.3.6**. The communities of Hialeah and Opa-locka are the only two that do not have scores over either thresholds for recreational engagement or reliance. All other communities have engagement and reliance scores that exceed at least one or both thresholds; therefore, most of these communities have some dependence on recreational fishing.

Another suite of indices created to examine the social vulnerability of coastal communities is presented in **Figure 3.3.7**. The three indices are poverty, population composition, and personal disruptions. The variables included in each of these indices have been identified through the literature as being important components that contribute to a community's vulnerability. Indicators such as increased poverty rates for different groups, more single female-headed households and children under the age of 5, disruptions such as higher separation rates, higher crime rates, and unemployment all are signs of populations experiencing vulnerabilities. These indicators are closely aligned to measures of environmental justice, which is addressed below. Again, for those communities that exceed the threshold it would be expected that they would exhibit vulnerabilities to sudden changes or social disruption that might accrue from regulatory change.

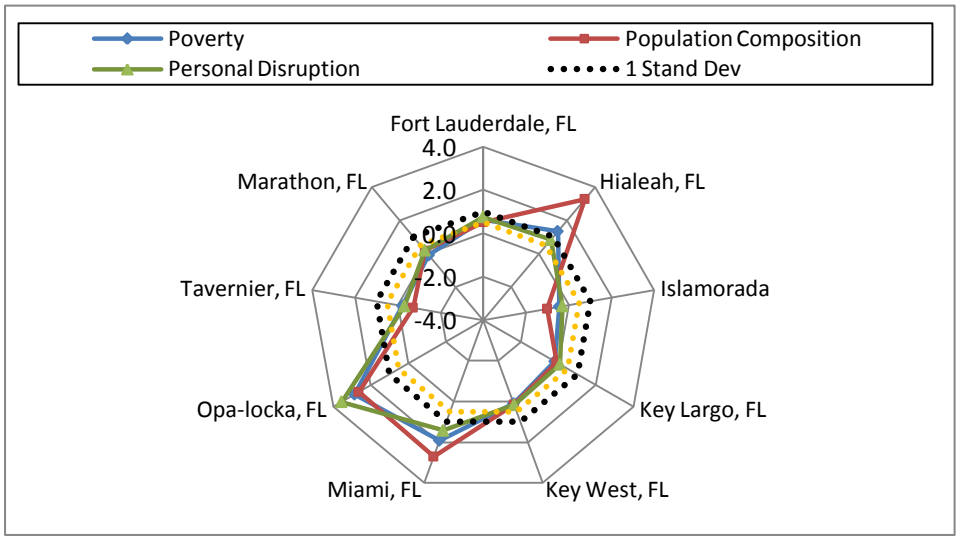

Figure 3.3.7. Social vulnerability indices for top yellowtail snapper fishing communities
Source: Social Indicators Database NMFS SERO (2012).

As depicted in **Figure 3.3.7** the communities of Miami, Opa-locka, and Hialeah, Florida, all exceed the threshold of one standard deviation above the mean for social vulnerability. It would be expected that these communities would be especially vulnerable to any social or economic disruption because of regulatory change, depending upon their engagement and reliance upon commercial fisheries.

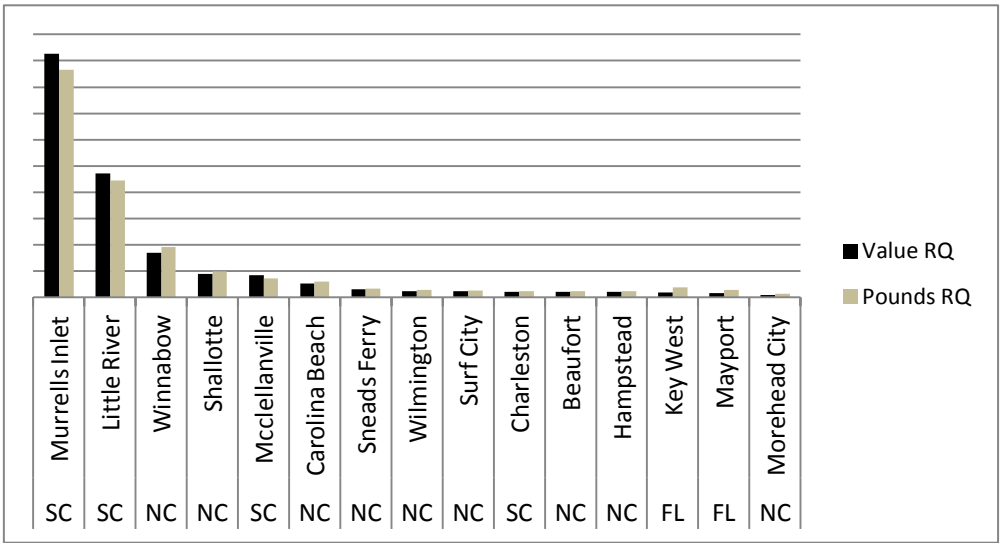

Figure 3.3.8. South Atlantic communities ranked by regional quotient of weight and value of shallow water grouper landings
Source: Accumulative Landings System (2011)

Figure 3.3.8 above shows shallow water grouper regional quotient landings and value of landings for the top fifteen South Atlantic communities with landings of shallow water grouper species. Again, actual values of quotients for pounds and value of landings are not reported on the y axis to address confidentiality concerns. Those communities with the highest regional quotients are located in North and South Carolina.

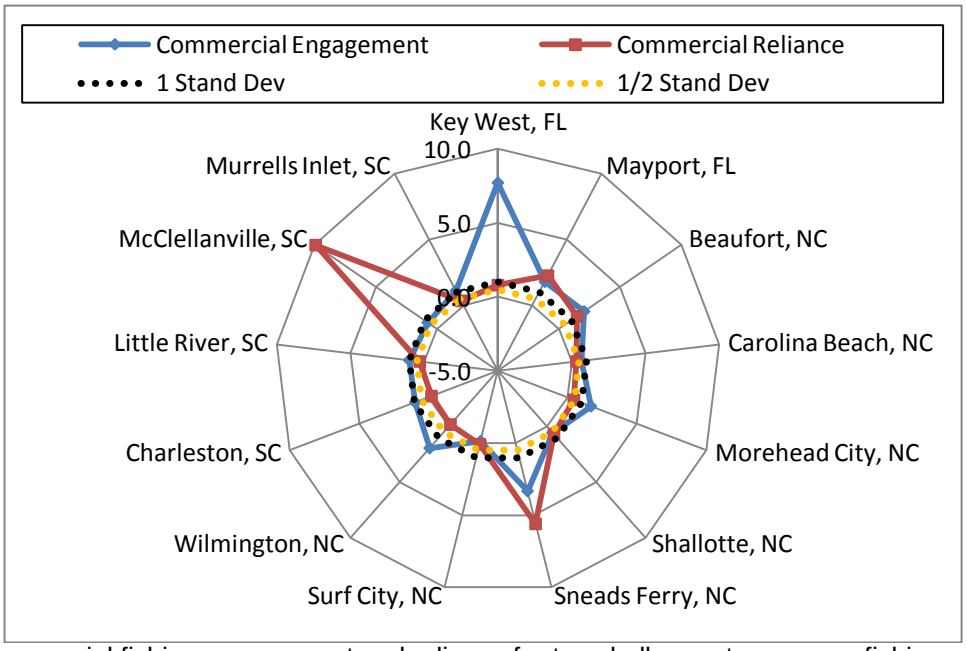

Figure 3.3.9. Commercial fishing engagement and reliance for top shallow water grouper fishing communities
Source: Social Indicators Database NMFS SERO (2012)

The same engagement and reliance index scores used previously are plotted in **Figure 3.3.9** for shallow water grouper communities but only for the commercial sector as the actions included in this amendment for shallow water grouper are for that sector alone. Most communities are outside both thresholds for commercial engagement with several outside for commercial reliance with the exception of Surf City, North Carolina. The communities of Charleston, South Carolina; Little River, South Carolina; Wilmington, North Carolina; Surf City, North Carolina; and Carolina Beach, North Carolina, are just below the threshold for commercial reliance. The other communities are dependent upon commercial fishing according to these indices.

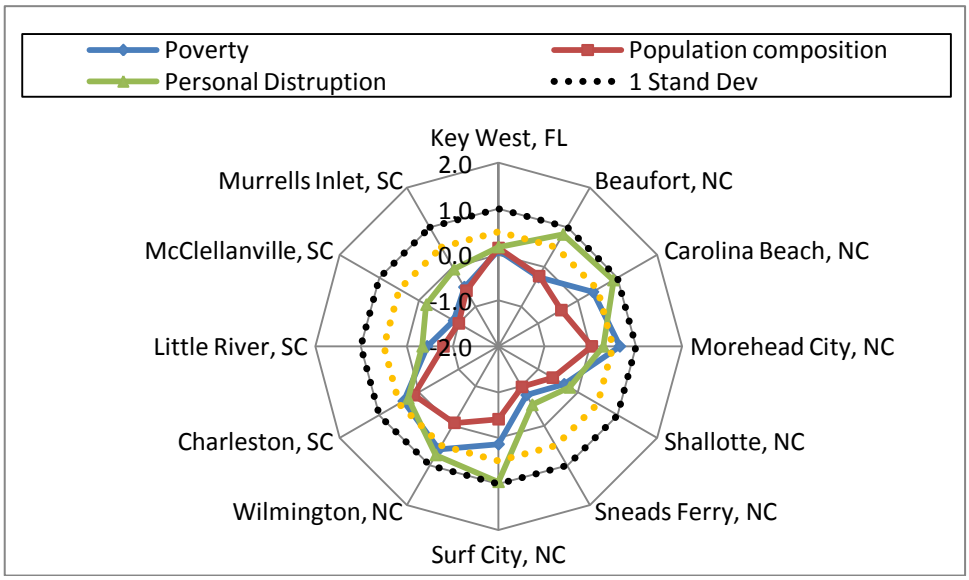

Figure 3.3.10. Social vulnerability indices for top shallow water grouper fishing communities
Source: Social Indicators Database NMFS SERO (2012)

The same suite of social vulnerability indices used in **Figure 3.3.9** is plotted for shallow water grouper fishing communities. Mayport, Florida, is not shown as there are no census demographics for the community at the place level. As shown in **Figure 3.3.10** there are no communities that exceed the threshold of one standard deviation and only a few exceed one-half standard deviation for more than a couple of the indices. Wilmington and Morehead City, North Carolina, and Charleston, South Carolina, are communities of that type. For those communities where all three indices are directionally the same and close to the thresholds, there could be some indication of vulnerabilities. As mentioned, these indices are very closely aligned with environmental justice concerns, which will be discussed next.

3.3.3 Environmental Justice

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

Information on the communities selected above was examined to identify the potential for EJ concern. Specifically, the rates of minority populations and the percentage of the population below the poverty line. The threshold for comparison is 1.2 times the state average such that, if the value for a community was greater than or equal to 1.2 times the state average, then the community is considered an area of potential EJ concern.

Using demographic information from the American Community Survey estimates for 2005-2009 the communities of Fort Lauderdale, Hialeah, Opa-locka, and Miami, FL; and Wilmington, NC, exceed the thresholds for poverty. The communities of Hialeah, Opa-locka, and Miami, FL exceed the threshold for minorities. If a community exceeds the thresholds, it would be considered vulnerable if regulatory action were to cause some type of social disruption. As mentioned earlier, these measures are closely aligned with the previous social indicators developed to demonstrate vulnerability. The communities that have been identified through both of these measures should be considered vulnerable to negative effects of regulatory action.

Although we have information concerning the community's overall status with regard to minorities and poverty, we do not have such information for fishermen themselves. Therefore, we can only place our fishing activity within the community as a proxy for understanding the role that minorities and poverty have in the vulnerability of those being affected by regulatory change. While subsistence fishing is also an activity that can be affected by regulatory change, we have very little, if any, data on this activity at this time. We assume that the effects to other sectors will be similar to those that affect subsistence fishermen who may rely on yellowtail snapper or shallow water grouper.

3.4 Administrative Environment

3.4.1 The Fishery Management Process and Applicable Laws

3.4.1.1 Federal Fishery Management

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

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

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

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

3.4.1.2 State Fishery Management

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

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

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

3.4.1.3 Enforcement

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

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

Administrative monetary penalties and permit sanctions are issued pursuant to the guidance found in the Policy for the Assessment of Civil Administrative Penalties and Permit Sanctions for the NOAA Office of the General Counsel – Enforcement Section. This Policy is published at the Enforcement Section's website: http://www.gc.noaa.gov/enforce-office3.html.

Chapter 4. Environmental Consequences and Comparison of Alternatives

4.1 Action 1. Revise Annual Catch Limit (ACL) and Optimum Yield (OY) for Yellowtail Snapper

4.1.1 Biological Effects

Effective November 7, 2012, a temporary rule through emergency action increased the yellowtail snapper commercial ACL from 1,142,589 pounds (lbs) whole weight (ww) to 1,596,510 lbs ww. The rule establishing the adjusted commercial ACL would expire 180 days from its implementation date (although an emergency rule can be extended for an additional 186 days) and the commercial ACL would revert back to 1,142,589 pounds whole weight.

For the recreational sector, **Alternative 1 (No Action)** would retain an ACL of 1,031,286 lbs ww and a recreational annual catch target (ACT) of 897,160 lbs ww.

Alternatives* for Action 1

1. No Action. ACL = OY = ABC
   Commercial ACL = 1,142,589
   Recreational ACL = 1,031,286
   Recreational ACT = 897,160

2 (Preferred). ACL = OY = ABC
Commercial ACL = 1,596,510
Recreational ACL = 1,440,990
Recreational ACT = 1,253,661

3. ACL = OY = 90% ABC
   Commercial ACL = 1,436,859
   Recreational ACL = 1,296,891
   Recreational ACT = 1,128,295

4. ACL = OY = 80% ABC
   Commercial ACL = 1,277,208
   Recreational ACL = 1,152,792
   Recreational ACT = 1,002,929

Alternative 1 (No Action), in the absence of an adjustment to the commercial ACL, would result in the greatest biological benefit to the yellowtail snapper stock in the South Atlantic. If the commercial ACL for yellowtail snapper is allowed to increase, then the biological benefits could be reduced. However, there is not a biological need to maintain a reduced ACL. Under **Alternative 1 (No Action)** catch levels would be below the level that the latest stock assessment (FWRI 2012) indicates can be harvested sustainably. Hence, **Alternative 1 (No Action)** would not achieve OY and therefore be contrary to the mandates of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act).

The Comprehensive ACL Amendment (SAFMC 2011c) set OY equal to the ACL for yellowtail snapper. National Standard 1 establishes the relationship between conservation and management measures, preventing overfishing, and achieving OY from each stock, stock complex or fishery. The NS1 guidelines discuss the relationship of overfishing limit (OFL) to the maximum sustainable yield (MSY) and ACT (ACL) to OY. The OFL, if provided by a Scientific and Statistical Committee (SSC), is an annual amount of catch that corresponds to the estimate of maximum fishing mortality threshold applied to a stock or complex's abundance; MSY is the long-term average of such catches. The ACL would be the limit that triggers accountability measures (AMs), and ACT, if specified, would be the management target for a fishery. Management measures for a fishery should, on an annual basis,

prevent the ACL from being exceeded. The long-term objective is to achieve OY through annual achievement of an ACL or ACT. OY would remain equal to the ACL under **Alternatives 2 (Preferred)**, **3**, and **4**.

Alternatives 3 and **4** would have a greater positive biological effect than **Preferred Alternative 2** because they would create a buffer between the ACL/OY and ABC, with **Alternative 4** setting the most conservative ACL at 80% of the ABC. Creating a buffer between the ACL/OY and ABC would provide greater assurance that overfishing is prevented, and the long-term average biomass is near or above B_{MSY}. However, the South Atlantic Fishery Management Council's (South Atlantic Council) SSC ABC control rule takes into account scientific uncertainty. The South Atlantic Council and Gulf of Mexico Fishery Management Council's (Gulf Council) SSCs recommended an ABC based on a 40% probability of overfishing (P*=0.4) for yellowtail snapper. The National Standard 1 guidelines indicate that the ACL should be less than or equal to the ABC. Setting a buffer between the ACL and ABC would be appropriate in situations where there is uncertainty in whether or not management measures are constraining fishing mortality to target levels. A recreational ACT would be set below the recreational ACL to account for management uncertainty and provide greater assurance that recreational landings do not exceed the established recreational ACL. During development of the Comprehensive ACL Amendment (SAFMC 2011c), the South Atlantic Council chose not to consider specifying an ACT for the commercial sector because recent improvements in the system that tracks commercial landings have reduced management uncertainty for that sector. ACTs are in place for the recreational sector.

The biological benefits of these alternatives to the protected species most likely to interact with snapper grouper hook-and-line gear (e.g., sea turtles and smalltooth sawfish) are unclear. Assuming the amount of fishing effort needed to achieve an ACL increases or decreases as an ACL increases or decreases, then a lower ACL would likely lead to lower fishing effort and lower likelihood of interaction with protected species. Under this scenario, **Alternative 1 (No Action)** would likely have greatest biological benefit to sea turtles and smalltooth sawfish. Likewise, **Alternative 4** would have next greatest biological benefit to sea turtles and smalltooth sawfish, followed by **Alternative 3**, and **Alternative 2 (Preferred)**.

4.1.2 Economic Effects

Analytical Approach

The procedure for calculating the economic effects of the management alternatives for the commercial sector typically involves estimating the expected changes in gross revenue, although net revenue and profits are better metrics. However, the assignment of costs to harvesting yellowtail snapper, South Atlantic shallow water grouper (SASWG), and gag cannot be undertaken with the currently available data and modeling approaches. SASWG includes gag, black grouper, red grouper, scamp, red hind, rock hind, yellowmouth grouper, yellowfin grouper, graysby, and coney. For current purposes, the average annual ex-vessel price for yellowtail snapper, SASWG, and gag in 2011 were $3.17, $5.14, and $5.42 per pound gutted weight (lb gw), respectively.

Similarly, the procedure for calculating the economic effects on the recreational sector typically involves estimating the expected changes in consumer surplus (CS) to anglers and net operating revenue (NOR) to for-hire vessels. Consumer surplus is the amount of money that an angler would be willing-

to-pay for a fishing trip over and above the cost of the trip. NOR is total revenue less operating costs, such as fuel, ice, bait, and other supplies. Since the for-hire and private recreational sectors do not have separate allocations, it is unknown how potential changes in recreational landings and the recreational ACL would be allocated between the for-hire and private recreational sectors. Thus, changes in NOR for the for-hire sector cannot be estimated. For current purposes, the best available estimate of CS for yellowtail snapper is $11.42 per lb ww (2011 dollars).

Effects Analysis

For the analysis of alternatives under **Action 1**, it is important to recall that annual commercial landings of yellowtail snapper were 895,145 lbs gw on average from 2007-2011, generally trended upward during that time, and were 1,026,374 lbs gw in 2011. Thus, the 2011 landings were basically equivalent to the commercial ACL of 1,029,421 lb gw under **Alternative 1 (No Action)**, or rather the commercial ACL that existed prior to the current temporary rule and would exist upon its expiration[7]. In effect, for the commercial sector, the status quo and 2011 conditions are equivalent. Conversely, annual recreational landings of yellowtail snapper were 541,301 lbs ww on average from 2007-2011, trended downward during this time, and were only 390,998 lbs ww in 2011. Thus, average and 2011 recreational landings were substantially less than the recreational ACL, under **Alternative 1 (No Action)**. As such, with respect to the estimates in **Table 4.1.1**, the potential increases in gross revenue are likely to occur as commercial vessels are expected to take advantage of any increase in the commercial ACL. Given the relative magnitude of the increases, the probability the commercial sector would take full advantage of the increased ACL is greatest under **Alternative 4**, followed by **Alternative 3**, and would be the least under **Alternative 2 (Preferred)**.

In addition, with respect to the estimated changes in gross revenues in the commercial sector, it is possible these estimates could represent changes in net revenue if vessels can increase their landings of yellowtail snapper without increasing their effort (i.e., trips) and thereby costs, which is quite possible given that vessels were able to achieve about the same level of landings in 2011 as in 2009 but with approximately 16% less effort. However, if vessels do take more trips, it is likely that gross revenue from other species will also increase, at least to some extent. These increases may not be proportional to the increase in yellowtail snapper gross revenue as ACLs for these other species (e.g., gag, vermilion snapper, etc.) may restrict harvest increases. Thus, it is possible these estimates may understate the actual gains in gross revenue and economic benefits for the commercial sector under **Alternatives 2 (Preferred)-4**.

Conversely, the potential increases in consumer surplus in the recreational sector are unlikely to occur, at least in the short-term because the current recreational ACL is not constraining harvest in the private recreational at the present time and likely will not constrain it in the near future. However, if landings in the recreational sector increase in the future, and those increases allow the private recreational and for-hire sectors to increase their harvests beyond what would have otherwise occurred without the increase in the ACL, then consumer surplus in the recreational sector and NOR in the for-hire sector would be expected to increase as a result. Thus, although increases in NOR in the for-hire sector are not expected in the short-term, increases may occur in the long-term.

[7] Since ex-vessel price is reported in lbs gw, the commercial ACL values have been converted from lbs ww to lbs gw.

Table 4.1.1. Changes in Gross Revenue and Consumer Surplus under the Alternatives for **Action 1**.

Alternative	Commercial ACL (lbs gw)	Yellowtail Snapper Gross Revenue	Recreational ACL (lbs ww)	Yellowtail Snapper Consumer Surplus
1	1,029,421	$3,263,265	1,031,286	$11,776,510
2 (Preferred)	**1,438,297**	**$4,559,401**	**1,440,990**	**$16,456,106**
3	1,294,468	$4,103,464	1,296,891	$14,810,495
4	1,150,638	$3,647,523	1,152,792	$13,164,885

Based on the information in **Table 4.1.1**, **Preferred Alternative 2** would be expected to generate the greatest economic benefits relative to **Alternative 1 (No Action)**, followed by **Alternative 3** and **Alternative 4**, in terms of potential increases in gross revenue and consumer surplus to the commercial and recreational sectors, respectively. **Preferred Alternative 2** would establish the same commercial ACL implemented under the current temporary rule.

Specifically, **Preferred Alternative 2** would likely lead to an increase in gross revenue of approximately $1.3 million for the commercial sector and a potential increase of approximately $4.68 million for the recreational sector relative to **Alternative 1 (No Action)**. Under **Alternative 3**, the likely increase in gross revenue and potential increase in consumer surplus would be approximately $840,000 and $3.03 million for the commercial and recreational sectors, respectively. Under **Alternative 4**, the likely increase in gross revenue and potential increase in consumer surplus would be approximately $384,000 and $1.39 million for the commercial and recreational sectors, respectively.

4.1.3 Social Effects

Effective November 7, 2012, a temporary rule through emergency action increased the commercial ACL from 1,142,589 lbs ww to 1,596,510 lbs ww. Therefore, **Alternative 1 (No Action)** could have negative social effects as it would revert to the old commercial ACL, which was exceeded and initiated the request for emergency action by the South Atlantic Council. **Alternative 1 (No Action)** would seem to negate any reason for an emergency rule and seem contradictory to stakeholders who saw the need to extend the fishing year. The most recent stock assessment (FWRI 2012) prompted a revision of the ABC level, which indicated the ACL could be increased. An ACL that is set equal to ABC, as proposed in **Preferred Alternative 2,** would provide the largest increase and may be sufficient in terms of biological protection as the ABC level itself takes into consideration scientific uncertainty as discussed under the biological effects. The ACLs proposed in **Alternative 3** and **Alternative 4** are reduced by buffers of 10% and 20% of ABC, respectively, and could have fewer positive social effects if they curtail harvest. An increase in the ACL for yellowtail snapper in South Atlantic waters is likely to have positive social effects, as it may avoid AMs from being triggered in the commercial and recreational sectors. These AMs include an in-season closure of the commercial sector, or a reduction in the length of the recreational fishing season in the year following an ACL overage. Premature closure from an ACL that is too low would likely force fishermen to switch to other species, if possible. Allowing fishermen to continue harvest of yellowtail snapper through a higher ACL will add flexibility to their annual fishing since harvest of other species may be curtailed due to regulatory or environmental change. Choosing an ACL that initiates a premature closure can have detrimental effects as fishing patterns must change and lost revenues may occur. The overall social effects of increased harvest should be positive as fishermen would appreciate the action of the South Atlantic Council and the

National Marine Fisheries Service (NMFS) in response to the new stock assessment and the potential of an early closure under the old commercial ACL. Allowing for continued harvest would provide revenues without changing fishing behaviors or patterns that should translate into positive social effects, in contrast to early closure that could impose unnecessary hardships to individuals, businesses, and their communities. Those negative social effects would likely affect communities where social vulnerabilities are the highest; however, the negative social effects would also be tied to a particular community's dependency on commercial fishing and yellowtail snapper. Communities of Miami, Hialeah and Opa-locka, Florida, that have high social vulnerabilities are not as reliant on commercial or recreational fisheries.

4.1.4 Administrative Effects

Modifying the ACLs and OY for yellowtail snapper would not have direct impacts on the administrative environment. ACLs are already in place for yellowtail snapper, and commercial and recreational closures have not taken place in the past. Under the current management system, the lower the ACL is set the more likely it is to be met or exceeded, and the more likely an AM would be triggered resulting in the greatest administrative impact.

Alternatives* for Action 2

1 (Preferred). No Action. Retain calendar year as fishing year and there is no spawning season closure in place.

2. Commercial fishing year for yellowtail snapper:
   - 2a. June 1 to May 31
   - 2b. July 1 to June 30
   - 2c. August 1 to July 31
   - 2d. September 1 to August 31

3. Recreational fishing year for yellowtail snapper:
   - 3a. June 1 to May 31
   - 3b. July 1 to June 30
   - 3c. August 1 to July 31
   - 3d. September 1 to August 31

4. Spawning season closure for the commercial sector:
   - 4a. April 1 to June 30
   - 4b. June 1 to August 31
   - 4c. April 1 to May 31
   - 4d. June 1 to July 31

4.2 Action 2. Yellowtail Snapper: Commercial and Recreational Fishing Year and Commercial Spawning Season Closure

4.2.1 Biological Effects

The commercial and recreational fishing year for yellowtail snapper begins on January 1 and ends on December 31. **Preferred Alternative 1 (No Action)** would not change the commercial or recreational fishing year. Average commercial landings for 2006-2011 were highest from March to July with the highest landings in May and June (**Figure 4.2.1** and **Table 4.2.1**). Average recreational landings from 2006-2011 (**Figure 4.2.2**), however, were more spread out over the summer months than average commercial landings (**Figure 4.2.1**) with a peak from mid-July to mid-August.

Alternative 2 and its sub-alternatives consider various start dates for the commercial fishing year; whereas **Alternative 3** and its sub-alternatives consider various start dates for the recreational fishing year. Assuming implementation of the new commercial ACL as proposed under **Action 1**, it is unlikely that yellowtail snapper

commercial or recreational ACLs would be met during the fishing year and there would be no additional biological effects from a change in the fishing year under **Action 2**.

If the ACL is met for the commercial sector, the AM is to prohibit harvest and possession in season. If the recreational ACL is met, the AM is to monitor landings in the following fishing year and potentially reduce the length of the fishing year. Therefore, if the commercial or recreational ACL was expected to be met, then the start of the fishing year could be adjusted to increase the probability that the closed months would occur during the peak spawning period. A fishing year start of August 1, as **Sub-alternatives 2c** and **3c** propose, would be biologically advantageous because the closed months are more likely to coincide with the yellowtail snapper spawning season. Similarly, **Sub-alternatives 2d** and **3d**, which would change the start date of the fishing year to September 1, could be biologically beneficial but not as much as **Sub-alternatives 2c** and **3c**. **Sub-alternatives 2a**, **2b, 3a,** and **3b** could result in positive biological impacts if closures occurred during the beginning of peak spawning for yellowtail snapper; however, biological benefits for other sub-alternatives would likely be greater.

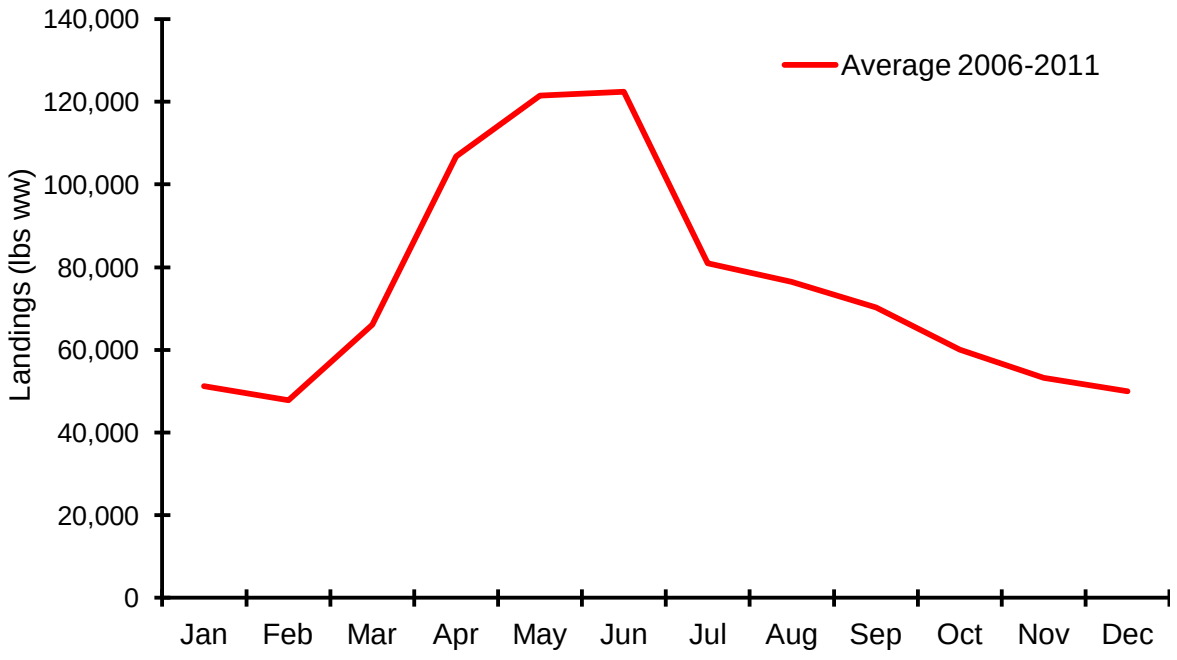

Figure 4.2.1. Average commercial landings of yellowtail snapper in the South Atlantic by month from 2006 through 2011.
Source: Commercial ACL dataset, NMFS Southeast Regional Office.

The commercial harvest of yellowtail snapper has never been prohibited because of landings meeting or exceeding the ACL. Similarly, the length of the recreational fishing season for yellowtail snapper has never been shortened because the recreational ACL was exeeded. In addition, all of the alternatives under **Action 1** would increase the ACLs by some amount. Hence, it is likely that commercial and recreational harvest would continue to take place year-round with an increase in the ACL proposed under **Action 1** and a change in the fishing year would not result in any additional

biological benefits. However, modifying the recreational fishing year could have some biological impacts because if the recreational ACL is met, the post-season AM is to shorten the length of the following fishing year. A shortening of the fishing year could translate into decreased fishing pressure during the yellowtail snapper spawning season, thus resulting in positive biological effects.

On the other hand, an indirect biological benefit would result from **Preferred Alternative 1 (No Action)** in that the fishing year used in future stock assessments for the species would be consistent with previous ones. If the fishing year were to change, then future stock assessments would have to account for the discrepancy, possibly introducing more uncertainty in the assessment results. This situation is now the case with black sea bass, for which the fishing year was changed from a calendar year to one beginning on June 1. In addition, yellowtail snapper are assessed as one stock in the Gulf of Mexico and South Atlantic. Stock assessments could be further confounded if the fishing year changed in the South Atlantic but not the Gulf of Mexico.

Table 4.2.1. Average monthly commercial landings (pounds whole weight) for yellowtail snapper for the period 2006-2011.

Month	Pounds Whole Weight
January	51,237
February	47,804
March	66,008
April	106,781
May	121,490
June	122,427
July	81,011
August	76,514
September	70,222
October	60,090
November	53,274
December	50,015

Source: Commercial ACL dataset, NMFS Southeast Regional Office.

For management and stock assessment purposes, there are advantages to identical fishing years between the commercial and recreational sectors. Changing the fishing year for the recreational sector, but not the commercial sector, would result in additional data adjustments that introduce some level of uncertainty to a stock assessment and may compromise the ability to compare results with previous assessments. Different fishing years in the Gulf of Mexico and South Atlantic for yellowtail snapper would further accentuate this problem. **Preferred Alternative 1 (No Action)** would avoid this type of troubleshooting and maintain consistency in the input data for an assessment model.

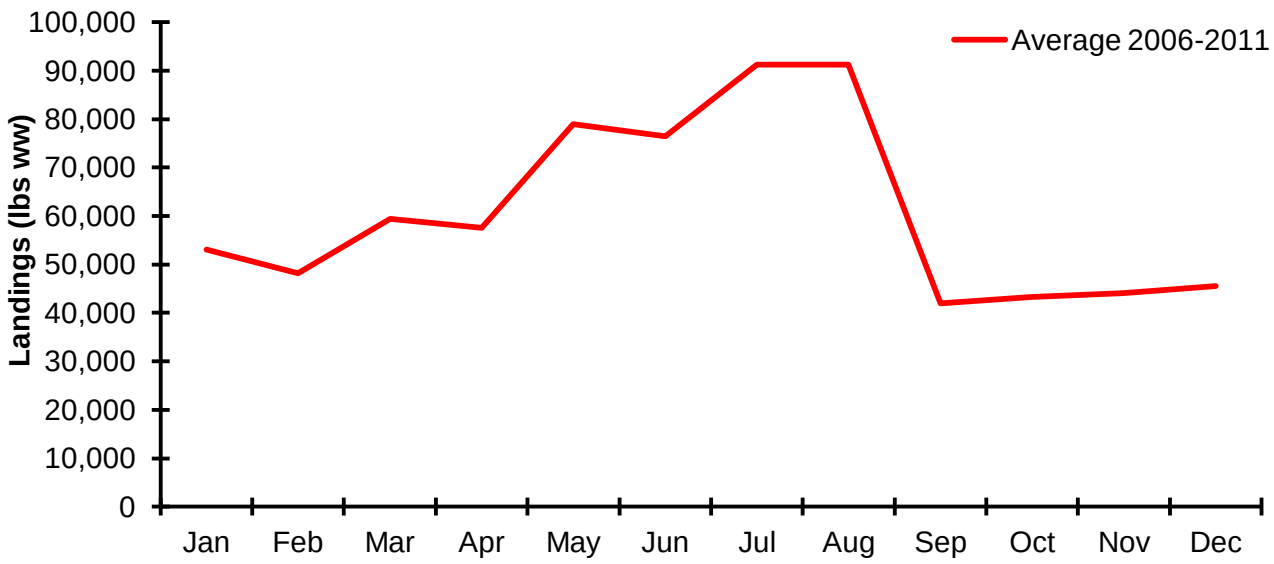

Figure 4.2.2. Average recreational landings of yellowtail snapper in the South Atlantic by month from 2006 through 2011.
Source: Marine Recreational Information Program (MRIP).

Alternative 4 and its sub-alternatives consider implementing a spawning season closure for the commercial sector only. As mentioned previously, yellowtail snapper have an extended spawning season, but most of the spawning activity in the area where the species is most abundant in South Atlantic waters is from April to August. In southeast Florida, spawning occurs during spring and summer and a large spawning aggregation reportedly occurs during May to July at Riley's Hump near the Dry Tortugas off Key West, Florida (Muller et al. 2003).

Any of the proposed sub-alternatives under **Alternative 4** would be more biologically beneficial than **Preferred Alternative 1 (No Action)**. However, as the recent stock assessment indicates yellowtail snapper is neither overfished nor undergoing overfishing, and the allowable catch for yellowtail snapper can be increased (**Action 1**), there may not be a biological need to implement a spawning season closure. Of the four sub-alternatives, **Sub-alternatives 4a** and **4b** would provide a longer hiatus in fishing activity and therefore result in greater biological benefits than **Sub-alternatives 4c** and **4d**. Whether **Sub-alternative 4a** would result in greater biological benefits than **Sub-alternative 4b**, or vice versa, is difficult to measure without more detailed information on the timing and intensity of spawning activity. If the spawning peak in South Florida occurs from May to July, as sugested by the presence of spawning aggregations, then both sub-alterantives would impart the same level of biological benefits to the yellowtail snapper stock.

Regardless of the alternative selected, this action is not anticipated to increase the potential for interactions with smalltooth sawfish. However, the biological impacts of these alternatives on sea turtles are unclear. Sea turtles nest along the East Coast of the United States from April-October, with peak nesting occurring from May-July. **Alternative 1 (No Action)** is likely to have the fewest biological benefits to protected resources because the peak harvest of yellowtail is currently occurring during sea turtle nesting season and often occurring during the peak nesting season. **Section 4.2.2** indicates that a change in the fishing year is likely to have little effect on actual fishing effort. If this

holds true then regardless of the alternative selected the overall impacts to sea turtles are likely to remain the same as under **Alternative 1 (No Action)**. However, in some fisheries effort peaks when a fishery first opens. This is most common when the fishery has been closed for some period before the season re-opens (i.e., a fishery closing when the ACL was met). The ACL for yellowtail has never been met, and would likely be increased in the future, reducing the likelihood of an effort increase at the beginning of a new fishing year. However, if fishing effort did increase at the beginning of the new fishing year, **Sub-alternatives 2d** and **3d** would likely be the most beneficial to sea turtles because any increase in fishing effort associated with the opening of the fishing season would occur outside the peak sea turtle nesting season, and at the tail end of the entire sea turtle nesting season. Conversely, **Sub-alternatives 2a** and **2d** would likely have far fewer biological benefits to sea turtles because any increase in effort would occur during peak nesting season. With respect to these alternatives, **Sub-alternatives 2b** and **3b**, and **Sub-alternatives 2c** and **3c** would increase biological benefits to sea turtles because the season opening date would occur later and later in the nesting season.

4.2.2 Economic Effects

Alternative 2 and its sub-alternatives are administrative in nature. Changing when the fishing year begins and ends, in and of itself, would not be expected to alter anglers' fishing behavior. Therefore, **Alternative 2** and its sub-alternatives would not be expected to generate any direct economic effects relative to **Preferred Alternative 1 (No Action)**. In 2011, however, commercial landings of yellowtail snapper were close to the commercial ACL implemented in 2012 through the Comprehensive ACL Amendment (SAFMC 2011c; see **Table 3.3.1**). Depending on whether a sub-alternative is selected under **Alternative 4** and which sub-alternative that is, the timing of a potential seasonal closure in combination with when the fishing year begins and ends could affect the seasonal distribution of commercial landings. However, most of those effects would be due to a spawning season closure (**Alternative 4**) rather than a change in the commercial fishing year (**Alternative 2**). Thus, while indirect economic effects are possible under **Alternative 2**, they are likely to be trivial and not differ to any noticeable degree across the four sub-alternatives.

Alternative 3 and its sub-alternatives are administrative in nature. Changing when the recreational fishing year begins and ends, in and of itself, would not be expected to alter anglers' fishing behavior and, as such, would not be expected to generate any direct economic effects. The recreational sector did not come close to harvesting its ACL in 2012. Thus, the alternative selected under **Action 1** would not be relevant with respect to potential indirect economic effects. Further, **Alternative 4** and its sub-alternatives do not apply to the recreational sector. Thus, even if a sub-alternative is selected under **Alternative 4** and biological benefits via stock enhancement do occur as a result, recreational harvest and its seasonal distribution are not expected to change and thus indirect economic effects are also not expected under **Alternative 4** and its sub-alternatives.

With respect to analyzing the direct economic effects of the sub-alternatives under **Alternative 4**, it is assumed the operational commercial ACL for yellowtail snapper is 1,596,510 lbs ww, or 1,438,297 lbs gw, which is the commercial ACL under **Preferred Alternative 2** for Action 1 and in the current temporary rule as well. The commercial ACL under **Preferred Alternative 2** for Action 1 is 40% higher than the ACL of 1,142,589 lbs ww, or 1,029,421 lbs gw, that existed prior to the temporary rule and would exist upon its expiration. In addition, it is 56% higher than the average annual commercial landings of yellowtail snapper in the South Atlantic from 2007-2011. As mentioned previously,

commercial landings in 2011 were close to the commercial ACL that went into place the following year; however, commercial landings from 2007 through 2010 were well below it. Thus, there is substantial uncertainty regarding any projection of a spawning season closure's effects. The commercial fishing industry may or may not increase its fishing effort and landings of yellowtail snapper under a higher ACL, though if 2011 is more indicative of future landings levels than previous yeas, it is likely they will. For additional discussion of that issue, refer to the analysis under Action 1.

The spawning closures under the various **Alternative 4** sub-alternatives would generally be during the times of relatively high fishing activity. From 2007 through 2011, 47% of the commercial yellowtail snapper landings by weight was harvested during the months of April, May, June, and July. The projections below assume that the future distribution of landings would continue to follow those recent seasonal patterns. The reductions in landings of yellowtail snapper and other species (e.g., SASWG, shallow water snapper other than yellowtail, etc.) harvested on trips landing yellowtail snapper during the different potential closure periods are labeled "Percentage of 2007-2011 yellowtail landings" and "Percentage of 2007-2011 other species landings," respectively. Two different scenarios are considered.

The first scenario assumes that vessels do not react to the new, higher ACL and continue to harvest at levels comparable to those under the current ACL of 1,142,589 lbs ww. This scenario is labeled "Reductions assuming 2007-2011 average landings" in **Table 4.2.2** and shows the loss of gross revenue from yellowtail snapper and other species harvested on trips landing yellowtail snapper that would have occurred had the spawning season closures been present under the various sub-alternatives. This scenario is unlikely but useful as a baseline for comparison. All gross revenue losses are listed in 2011 dollars, and the ex-vessel price of yellowtail snapper is assumed to be $3.17 per pound, its value in 2011.

The second scenario assumes that vessels react to the new, higher ACL by uniformly increasing harvest according to the historical distribution until they reach the new ACL. This scenario is labeled "Reductions assuming ACL is fully targeted" in **Table 4.2.2**. Spawning season closures under the various sub-alternatives would then reduce the annual landings of yellowtail snapper by the percentages listed at the top of **Table 4.2.2**. The effect on concurrently landed species are not projected under this scenario as the effect of non-yellowtail snapper ACLs would likely reduce the ability of vessels to retain those species at a uniformly higher landings level.

Table 4.2.2. Economic Effects of sub-alternatives under **Alternative 4** for **Action 2**.

	Sub-alternative 4a	**Sub-alternative 4b**	**Sub-alternative 4c**	**Sub-alternative 4d**
Percentage of 2007-2011 yellowtail landings	38%	32%	24%	23%
Percentage of 2007-2011 other species landings	23%	30%	28%	32%
Reductions assuming 2007-2011 average landings				
Reduction in yellowtail gross revenue	$1,075,303	$897,966	$687,027	$641,746
Reduction in non-yellowtail gross revenue	$211,953	$275,382	$251,953	$291,846
Reduction in total gross revenue	$1,287,256	$1,173,348	$938,980	$933,592
Reductions assuming ACL is fully targeted*				
Reduction in yellowtail gross revenue	$1,917,825	$1,601,540	$1,225,326	$1,144,567

*This refers to losses comparing the ACL to landings in months closed without any effort shift.

Relative to **Preferred Alternative 1 (No Action)**, **Sub-alternative 4a** would produce the greatest reduction in gross revenue under either of the scenarios, followed by **Sub-alternative 4b**, **Sub-alternative 4c**, and **Sub-alternative 4d**. The reduction in gross revenue of concurrently harvested non-yellowtail snapper species is the inverse order, with the greatest reduction occurring under **Sub-alternative 4d**, followed by **Sub-alternative 4b**, **Sub-alternative 4c**, and **Sub-alternative 4a**. Most importantly, the reduction in total gross revenue would be greatest under **Sub-alternative 4a**, followed by **Sub-alternative 4b**, **Sub-alternative 4c**, and **Sub-alternative 4d**.

Given the increases in commercial yellowtail snapper landings and the restrictions on commercial harvest of other snapper grouper species harvested by vessels harvesting yellowtail snapper (e.g., vermilion snapper, gag, and other SASWG) in recent years, it is assumed the reductions under the second scenario are more likely to occur. Thus, the expected losses in gross revenue under **Sub-alternative 4a**, **Sub-alternative 4b**, **Sub-alternative 4c**, and **Sub-alternative 4d** are approximately $1.92 million, $1.6 million, $1.23 million, and $1.14 million, respectively. These losses in gross revenue may in fact represent losses in net revenue if vessels are able to increase their landings of yellowtail snapper without increasing effort (i.e., trips) and thereby costs, which is quite possible given that vessels were able to achieve about the same level of landings in 2011 as in 2009 but with approximately 16% less effort. Further, these reductions in gross/net revenue could somewhat underestimate actual losses if vessels in fact increase their landings of species other than yellowtail snapper under the higher ACL.

As discussed in **Section 3.3.1**, a strong inverse relationship exists between landings and ex-vessel price for yellowtail snapper. Even if vessels temporally adjusted their effort to increase their landings in months when yellowtail harvest is allowed, the local markets may become saturated as a result of landings being consolidated in the months when yellowtail snapper is open, particularly just after and before the potential closure. It is highly likely ex-vessel prices would decrease as a result, which would in turn decrease gross revenue and thus losses would still occur under any of the sub-alternatives. The magnitude of these losses in gross revenue cannot be estimated with available information. However, the relative magnitude of those losses across alternatives would likely be similar to those discussed above given the amount of landings that are expected to be shifted from closed to open months under each alternative (i.e., losses in gross revenue would be greatest under **Sub-alternative 4a**, followed by **Sub-alternative 4b**, **Sub-alternative 4c**, and **Sub-alternative 4d**, respectively).

On the other hand, most of commercially harvested yellowtail snapper are landed in Florida, where weather patterns allow vessels greater leeway to fish throughout the year in comparison with states farther north. What is currently unknown is the degree to which vessels would be able to temporally shift their effort in response to a spawning season closure. For comparison, the January through April spawning season closure for gag has now been in place since 2010 in the South Atlantic region. This closure has had the effect of creating considerable producer demand for the species at the beginning and end of the commercial fishing season, as 47% of the Florida landings of gag in 2010 and 2011 occurred in the months of May and December combined. Thus, if yellowtail snapper vessels likewise temporally shift some of their effort, the projected losses of gross revenue listed above would be somewhat diminished. Nonetheless, the most important conclusion is that all of the sub-alternatives under **Alternative 4** are expected to partially, if not mostly, offset the expected gains in gross revenue from the increased ACL under Alternative 2 for **Action 1**.

4.2.3 Social Effects

Modification to the fishing year as proposed under **Alternatives 2** and **3**, would not result in additional biological benefits for yellowtail snapper if the ACL was increased under Action 1, and there would not be a difference from the status quo. If the ACL that is chosen in Action 1 is reached prior to the end of the fishing year, then modifying either or both the commercial and recreational fishing year can provide protection if the alternative chosen results in protecting spawning activity. Because yellowtail snapper spawn year-round with spawning in South Florida mainly from April through August, a fishing year that starts after August, as proposed under **Sub-alternatives 2d** and **3d**, would likely add the most protection if both the commercial and recreational sectors close prior to the end of the fishing year. The earlier the closure, the more the resulting biological benefits. **Sub-alternatives 2c** and **3c** would provide the next best level of protection under the same circumstances. However, such early closures would have negative social effects as indicated by the South Atlantic Council's decision to request an emergency rule. To provide the best protection to the spawning stock, a seasonal closure would be the most likely solution with varying degrees of social effects. **Sub-alternatives 4a** and **4b** would close the commercial sector over the longest period of time and occur during the time peak commercial harvest has occurred. **Sub-alternatives 4a** and **4b** would likely have the largest negative social effects and change fishing patterns the most. The revenues that are lost during those timeframes would likely have to be replaced and it may be difficult for fishermen to find substitutes. **Sub-alternatives 4c** or **4d** would also result in closing of the commercial sector during peak commercial harvesting but for a lesser period of time and, therefore, would have fewer negative social impacts. Whether fishermen could shift effort prior to or after the closure could possibly ameliorate some of the negative social effects, but if that occurs then the question becomes whether the closure would provide sufficient protection to spawning yellowtail snapper. Since yellowtail snapper are harvested in the Gulf of Mexico and South Atlantic, changing the fishing year or implementing a spawning season closure in just the South Atlantic could create confusion for fishermen in south Florida, and have negative social effects if one side of the Florida Keys is open to harvest of yellowtail snapper and the other is closed.

4.2.4 Administrative Effects

Proposed **Alternatives 2** and **3** could impact the administrative environment by possibly complicating the performance of future stock assessments. As explained in **Section 4.2.1**, stock assessment analysts would have to adjust the input data for an assessment model if a change in the fishing year occurs. Different fishing years in the South Atlantic and Gulf of Mexico would create further complications with conducting a stock assessment for yellowtail snapper. The analyses could become more time-consuming and burdensome when comparing results to those of previous stock assessments where the calendar year was used. Proposed **Alternatives 2** and **3** could also result in increased administrative adverse effects if fishing years were different in the Gulf of Mexico and South Atlantic. Different fishing years in the Gulf of Mexico and South Atlantic could create different timing for openings and closures in the two regions, which would enhance the administrative burden of announcing these events. Further, the burden to Law Enforcement would be increased, particularly in the Florida Keys, if there were different regulations for yellowtail snapper in the Gulf of Mexico and South Atlantic, **Alternative 4** could result in an increased administrative burden in that NMFS would have to announce the seasonal spawning season closure via issuance of Fishery Bulletins and other

informational materials on an annual basis. Increased administrative impacts would also be expected if there are different regulations and openings/closings of yellowtail snapper in the Gulf of Mexico and South Atlantic portion Florida Keys. However, any negative administrative effects from changing the fishing year or implementing a spawning season closure would not be expected to be substantial. Further, public confusion regarding the different fishing years or spawning season closures in the Gulf of Mexico versus the South Atlantic portion of South Florida could create law enforcement difficulties.

4.3 Action 3. Gag and Shallow Water Groupers: Commercial Annual Catch Limit and Accountability Measures

4.3.1 Biological Effects

Alternatives* for Action 3

1. No Action. Retain the gag ACL and the three commercial AMs.

2. Remove shallow water grouper closure AM and retain current commercial ACL for gag. Do not change other AMs for the rest of shallow water groupers.

3 (Preferred). Remove shallow water grouper closure AM and reduce commercial ACL to 326,722 pounds gutted weight for gag to account for discard mortality. Do not change other AMs for the rest of shallow water groupers.

*See Chapter 2 for a more detailed description of the alternatives.

A stock assessment completed in 2006 indicated gag was experiencing overfishing and was approaching an overfished condition (SEDAR 10 2006). Snapper Grouper Amendment 16 (SAFMC 2009a) established management measures to end overfishing of gag. These measures included a four-month (January through April) spawning season closure for recreational and commercial harvest of shallow water grouper species including gag, black grouper, red grouper, scamp, rock hind, red hind, coney, graysby, yellowfin grouper, yellowmouth grouper, and tiger grouper (removed from the FMP in 2011); a directed commercial ACL for gag; and a reduction in the recreational bag limits for shallow water grouper species. Also included was a provision to close all shallow water grouper species when the gag ACL was met or projected to be met. The intent of this action was to reduce incidental catch of gag. The gag commercial AM has only been triggered once since it was implemented in 2009, which resulted in a closure of shallow water groupers in 2012. The commercial ACL was also exceeded by 21% in 2011, but it did not trigger the AM as the overage was not realized until after the fishing year had ended.

Regulations implemented through the requirements of the Reauthorized Magnuson-Stevens Act have placed restrictions on species that co-occur with gag and have likely been more effective in reducing incidental catch of gag than the provision to close shallow water grouper species when the gag quota is met. Additional protection to gag has been provided in the form of ACLs and AMs for other managed species. Amendment 17B to the Snapper Grouper FMP (SAFMC 2010b) established ACLs and AMs for eight species in the South Atlantic snapper grouper fishery undergoing overfishing in 2009, including gag. Amendment 17B also established commercial and recreational ACLs and AMs for an aggregate of gag, red grouper, and black grouper. The Comprehensive ACL Amendment (SAFMC 2011c) established ACLs for snapper grouper species not undergoing overfishing, including scamp, as

well as an aggregate of the remaining shallow water grouper species (rock hind, red hind, coney, graysby, yellowfin grouper, and yellowmouth grouper; **Table 4.3.1**).

Amendment 24 to the Snapper Grouper FMP (SAMFC 2011d) implemented individual ACLs and AMs (commercial and recreational) for red grouper, and removed ACLs and AMs for the commercial and recreational gag/red grouper/black grouper aggregate. Amendment 24 also put in place a rebuilding plan for red grouper as an assessment completed in 2009 (SEDAR 19 2010) determined the stock was experiencing overfishing and was overfished. However, Amendment 24 indicated the four-month spawning season closure implemented through Amendment 16 was more than sufficient to end overfishing of red grouper. Furthermore, Amendment 17A to the Snapper Grouper FMP established a commercial and recreational ACL of 0 (landings only) for red snapper (SAFMC 2010a).

Currently, among the shallow water grouper species, there are individual commercial and recreational ACLs and AMs for gag, red grouper, black grouper, and scamp. There is a commercial and recreational aggregate ACL for the remaining shallow water grouper species (rock hind, red hind, coney, graysby, yellowfin grouper, and yellowmouth grouper; **Table 4.3.1**). The commercial AM for these species is to prohibit harvest of the species when the ACL is met or expected to be met.

Table 4.3.1. Commercial and recreational ACLs for snapper grouper species.

Deep-Water	Comm.	Rec.	Shallow water Groupers	Comm.	Rec.
Yellowedge grouper	343,869 lbs ww	332,039 lbs ww	Red hind	49,488 lbs ww	48,329 lbs ww
Blueline tilefish			Rock hind		
Silk snapper			Coney		
Misty grouper			Graysby		
Queen snapper			Yellowfin grouper		
Sand tilefish			Yellowmouth grouper		
Black snapper			**Individual ACLs**	**Comm.**	**Rec.**
Blackfin snapper			Atlantic Spadefish	36,476 lbs ww	246,365 lbs ww
Jacks	**Comm.**	**Rec.**	Bar Jack	6,686 lbs ww	13,834 lbs ww
Almaco jack	193,999 lbs ww	261,490 lbs ww	Black grouper	90,575 lbs ww	155,020 lbs ww
Banded rudderfish			Blue Runner	188,329 lbs ww	1,101,612 lbs ww
Lesser amberjack			Goliath Grouper	0 lbs ww	0 lbs ww
Snappers	**Comm.**	**Rec.**	Gray Triggerfish	305,262 lbs ww	367,303 lbs ww
Cubera snapper	204,552 lbs ww	882,388 lbs ww	Greater Amberjack	800,163 lbs ww	1,167,837 lbs ww
Gray snapper			Hogfish	48,772 lbs ww	98,866 lbs ww
Lane snapper			Mutton Snapper	157,743 lbs ww	768,857 lbs ww
Dog snapper			Nassau Grouper	0 lbs ww	0 lbs ww
Mahogany snapper			Red porgy	197,652 lbs ww	197,652 lbs ww
Porgies	**Comm.**	**Rec.**	Scamp	341,636 lbs ww	150,936 lbs ww
Jolthead porgy	35,129 lbs ww	112,485 lbs ww	Wreckfish	237,500 lbs ww	12,500 lbs ww
Knobbed porgy			Yellowtail Snapper	1,142,589 lbs ww	1,031,286 lbs ww
Saucereye porgy			Red Grouper	284,680 lbs ww	362,320 lbs ww
Whitebone porgy			Snowy Grouper	82,900 lbs gw	523 fish
Scup			Warsaw Grouper	0 lbs ww	0 lbs ww
Grunts	**Comm.**	**Rec.**	Black Sea Bass	309,000 lbs gw	409,000 lbs gw
White grunt*	214,624 lbs ww	562,151 lbs ww	Speckled Hind	0 lbs ww	0 lbs ww
Margate			Golden Tilefish	541,295 lbs gw	3,019 fish
Sailor's choice			Black Grouper	90,575 lbs ww	155,020 lbs ww
Tomtate			Gag	352,940 lbs gw	340,060 lbs gw
			Red Snapper	0 lbs gw	0 lbs gw
			Vermilion Snapper	315,523 lbs gw	307,315 lbs gw
				302,523 lbs gw	

Source: Comprehensive ACL Amendment (SAFMC 2011c)

Data from the Southeast Fisheries Science Center logbook program (accessed 6 May 2010) were analyzed to identify species that are commonly caught together, including those caught with gag. Analyses of commercial logbook data were restricted to 2005-2009, because depth of capture, reported from 2005 onward, is an important consideration when evaluating similarities in fisheries vulnerability. Gag are primarily taken with vertical hook-and-line gear on commercial trips. Based on the evaluation of 136,005 commercial vertical line logbook records from 2005-2009, gag are most commonly taken with red porgy, red snapper, vermilion snapper, gray triggerfish, red grouper, scamp, and almaco jack (**Figure 4.3.1**) and are not commonly taken with many shallow water grouper species (black grouper, rock hind, red hind, coney, graysby, yellowfin grouper, yellowmouth grouper).

Existing regulations that impact species that are most commonly harvested with gag are, therefore, also having an effect on the commercial take of gag. Harvest of four co-occurring species (gag, red grouper, scamp, and red porgy (commercial only)) is prohibited during January-April of each year. Amendment 16 (SAFMC 2009a) implemented the four-month spawning season closure for the shallow water grouper species, which includes gag, red grouper, and scamp, and Amendment 12 to the Snapper Grouper FMP (SAFMC 2000) established the four-month commercial spawning season closure for red porgy and restricted recreational harvest to 1 fish per day.

Furthermore, as a result of the implementation of ACLs through the Reauthorized Magnuson-Stevens Act, closures have occurred for many of the main species that co-occur with gag including red snapper, vermilion snapper, gray triggerfish, and almaco jack. In response to an assessment (SEDAR 24 2010), which indicated red snapper were experiencing overfishing and are overfished, a harvest and possession prohibition of red snapper was implemented on January 4, 2010. Through Amendment 17A (SAFMC 2010a), the harvest prohibition of red snapper was continued with the specification of an ACL = 0 (landed catch only). A very short commercial and recreational fishing season occurred in Fall 2012 to allow for a very small amount of red snapper harvest (13,067 fish). A January-June 315,523 lb gw ACL, and July-December 305,523 lb gw ACL has been in place for commercial harvest of vermilion snapper since 2009. Commercial closures of harvest and possession of vermilion snapper have occurred on September 18, 2009; October 6, 2010; March 10, 2011; September 30, 2011; February 29, 2012; and September 28, 2012; and February 13, 2013. Commercial ACLs were established for gray triggerfish and almaco jack on April 16, 2012. Commercial harvest and possession of gray triggerfish closed on September 11, 2012, and the Jacks Complex, which includes almaco jack, lesser amberjack, and banded rudderfish, was closed to commercial harvest on July 2, 2012.

The spawning season and in-season closures of species that co-occur with gag may be responsible for the low rate of commercial discards. Examination of discard logbook data shows that the rate (# of fish per hook hour) of discarded gag was very low in 2007-2010, and decreased in 2011 (**Figure 4.3.2**). As the gag commercial AM had never been triggered prior to 2012, the decline in discards is not due to closing shallow water species when the gag quota is met, and is likely a result of other management measures that have reduced fishing effort on gag and co-occurring species.

The South Atlantic commercial gag discard rate in **Figure 4.3.2** was generated using the commercial discard and commercial landings logbooks (SEFSC 2012). The code was obtained from the Southeast Fisheries Science Center and only slightly modified. A discard rate was determined for gag, by year, for vertical line unit effort (hook hours) from the commercial discard logbook, which is a random (~20%) sub-sample of the commercial snapper grouper fleet. Effort was all snapper grouper trips.

This discard rate (#fish/hook hour) was then applied to the total hook hours reported for snapper grouper trips from the commercial landings logbook, by year, for vertical line gears, to determine total discards. This is a very crude approach and does not account for differences by gear (because only vertical line gears are included), by season, by area, by depth, etc. It also assumes that the gag discard rate observed from the discard logbook is applicable to total snapper grouper effort. This approach was used in previous SEDAR work, but in some instances has been supplanted by more rigorous discard estimation methods. The modeling approach does not make any extrapolations towards future discard rates (i.e., it is not a projection model). The rates could be considered nominal values (Pers. Comm., Nick Farmer, SERO, March 2013).

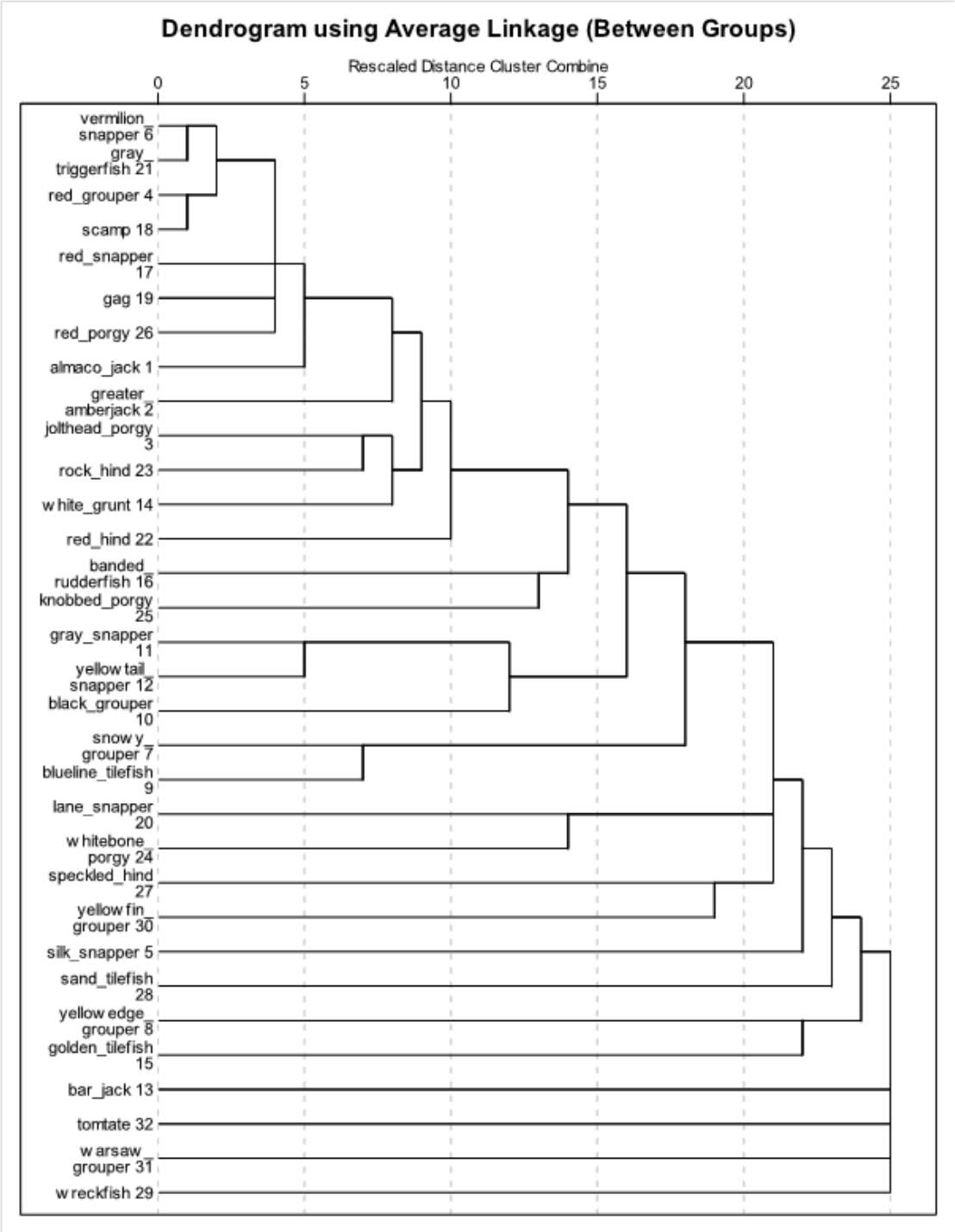

Figure 4.3.1. Hierarchical cluster analysis of species presence-absence in the snapper grouper commercial vertical line landings aggregated by year, month, area, and depth.
(Linkage Method: Between (Average), Dissimilarity Measure: Sørenson (Binary)). Numbers denote case numbers.
Source: SERO-LAPP-2010-06.

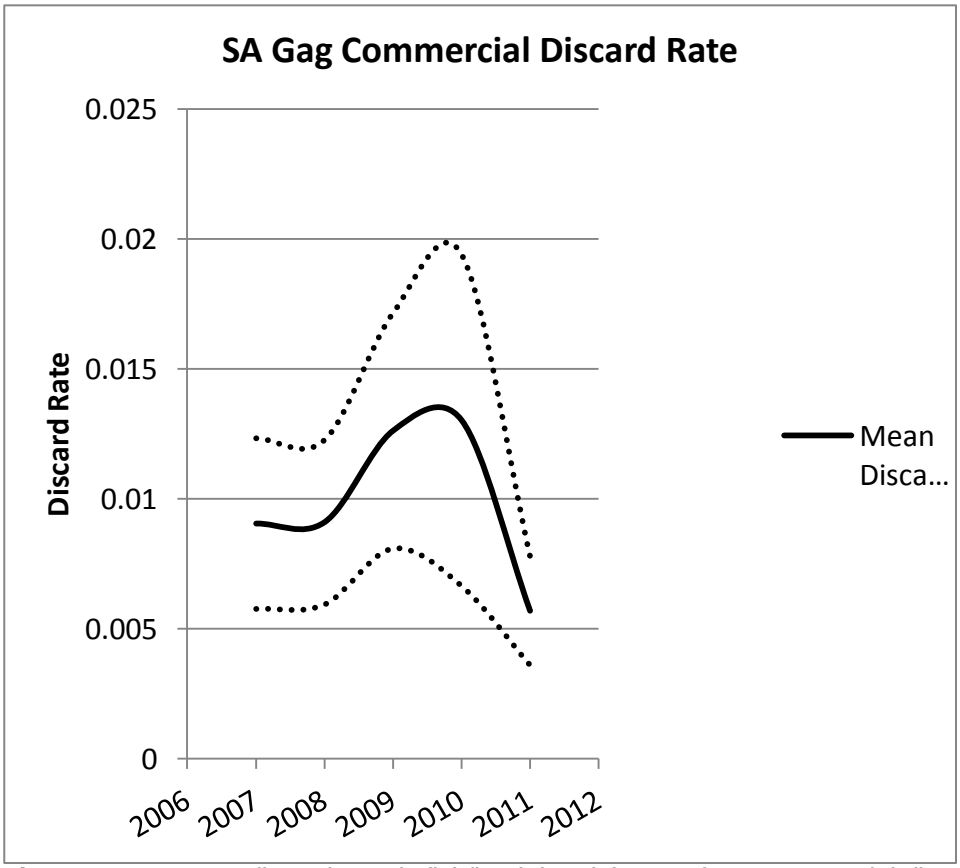

Figure 4.3.2. Mean discard rate (# fish/hook hour) for gag from commercial discard logbook data. Source: NMFS SERO

Alternative 1 (No Action) established through Amendment 16 (SAFMC 2009a) to close all shallow water grouper species when the gag quota is met, is not having the intended effect of reducing incidental catch of gag. This gag commercial AM had not been triggered prior to 2012 and, as mentioned previously, most of the shallow water grouper species do not commonly co-occur with gag. The ACLs and AMs established for snapper grouper species in Amendment 17B (SAFMC 2010b), the Comprehensive ACL Amendment (SAFMC 2011c), Amendment 24 (SAFMC 2011d), and Amendment 17A (SAFMC 2010a), along with the four-month shallow water grouper spawning season closure, are providing greater protection for gag than the closure of shallow water grouper species when the gag quota is met, as specified in **Alternative 1 (No Action)**. The gag quota was projected to be met on October 20, 2012, and resulted in a closure of all the shallow water grouper species. While any closure would be expected to have positive biological effects on gag and other snapper grouper species, measures implemented since Amendment 16 appear to be reducing incidental catch of gag. Therefore, retention of the **Alternative 1 (No Action)** provision to close all shallow water grouper species when the gag quota is met could have unnecessary economic and social impacts as it is not likely needed to ensure that overfishing of gag does not occur.

Alternative 2 would retain existing AMs for all shallow water groupers, except for gag. Instead of prohibiting harvest of all shallow water groupers when the gag ACL is met or projected to be met, **Alternative 2** would only prohibit harvest of gag, while harvest of the remainder of the shallow water groupers would be constrained by their respective ACLs (red grouper, black grouper and scamp) or by the Shallow Water Grouper Complex ACL (red hind, rock hind, yellowfin grouper, yellowmouth

grouper, graysby and coney). In general, the biological benefits of **Alternative 2** could be slightly less than those of **Alternative 1 (No Action)**, but harvest of all species would continue to be dictated by the established ACLs, thus ensuring that overfishing does not occur.

In terms of gag bycatch, **Alternative 2** would result in low negative biological impacts. Recent studies suggest that with the exception of red grouper and scamp, gag are not as closely associated in the landings with the rest of the shallow water grouper species as was previously thought (**Figure 4.3.1**). The Snapper Grouper Advisory Panel (AP) indicated that red grouper, which were shown in the past to co-occur with gag based on trip-level data, can be targeted effectively to avoid encounters with gag. **Figure 4.3.3** below shows the number of red grouper per trip relative to the number of gag per trip off North Carolina from May to August 2003. A clear separation is evident between trips that targeted gag versus those that targeted red grouper. Moreover, fishermen have emphatically stated that the two species can be effectively targeted, particularly off North Carolina.

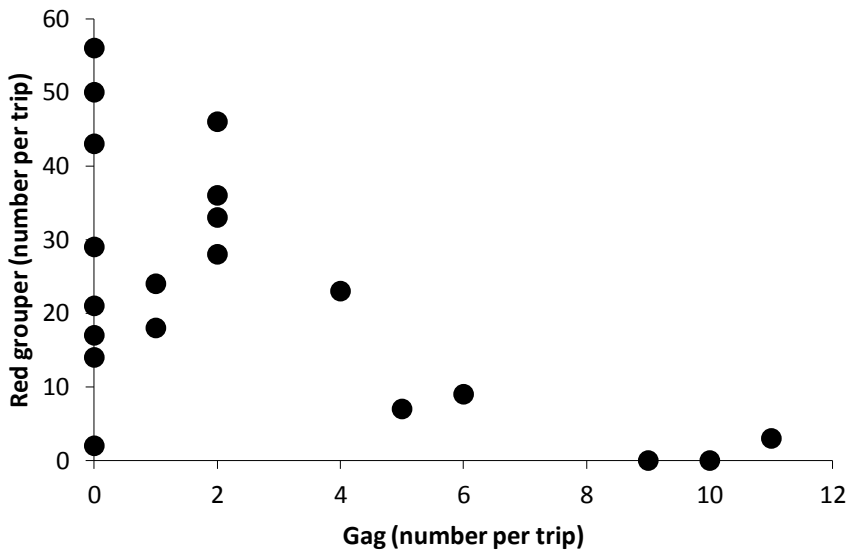

Figure 4.3.3. Number of red grouper per trip relative to the number of gag per trip on trips taken between May and August 2003 off North Carolina.
Source: J. Buckel, North Carolina State University, unpublished.

Results of an examination of 1,254 South Atlantic coastal logbook trips that took place from 2009 to 2011 that landed at least one pound of gag between October 21 and December 31 are shown in **Table 4.3.2** below. The majority of the trips (54%) landed only gag, and only 15.6% of the trips included other shallow water grouper species.

Table 4.3.2. South Atlantic commercial trips from 2009 to 2011 that landed at least one pound of gag between October 21 and December 31.

Reported in the Landings	# of Trips	%
Only Gag	683	54.5
Gag and Red Grouper	97	7.7
Gag and Scamp	84	6.7
Gag and Black Grouper	13	1.0
Gag and Red Hind	2	0.2
Gag and Rock Hind	0	0
Gag and Yellowmouth	0	0
Gag and Yellowfin	0	0
Gag and Graysby	0	0
Gag and Coney	0	0
Most Frequent Combinations of Species Landed		
Gag with Red grouper, Rock Hind, and Scamp	99	7.9
Gag with Red Grouper and Scamp	99	7.9
Gag, Red Grouper, Red Hind, and Scamp	63	5.0
Gag, Rock Hind, and Scamp	28	2.2
Gag, Red Grouper, Rock Hind, Scamp, and Yellowfin Grouper	13	1.0
Gag, Red Grouper, and Rock Hind	12	1.0
Other combinations with Gag	61	4.9
Total	1,254	100

Source: NMFS SERO

When examining commercial trips in the South Atlantic that landed at least one pound of red grouper between October 21 and December 31, 2011 (**Table 4.3.3**), 25% contained only red grouper whereas 16% contained gag and red grouper.

Table 4.3.3. South Atlantic commercial trips for 2011 that landed at least one pound of red grouper between October 21 and December 31.

Reported in the Landings	# of Trips	%
Only Red Grouper	55	25.3
Red Grouper, Gag, and Scamp	36	16.6
Red Grouper and Gag	35	16.1
Red Grouper, Gag, Rock Hind, and Scamp	23	10.6
Red Grouper and Black Grouper	20	9.2
Red Grouper, Gag, Red Hind, and Scamp	15	6.9

Source: NMFS SERO

Since recent studies have suggested that with the exception of red grouper and scamp, gag are not as closely associated in the landings with the rest of the shallow water grouper species as was previously thought (**Figure 4.3.1**), an analysis was conducted to determine the percent of gag caught incidentally on trips that targeted red grouper off North Carolina. Red grouper comprised an average of 25% on trips targeting gag from 2008 to 2012, as shown in **Table 4.3.4**; whereas gag comprised an average of 23.6% of the landings on red grouper trips (**Table 4.3.5**). For more detail on landings trends for gag and other shallow water groupers in North Carolina, see **Appendix F**.

Table 4.3.4. Annual landings of gag grouper and red grouper on gag "target" trips off North Carolina from 2008 through 2011.
Gag "target" trip = trip landing >200 lbs of gag. Landings in pounds whole weight.

	Gag		Red Grouper		
Year	**Total landings**	**Average Landings**	**Total Landings**	**Average Landings**	**Percent red grouper per trip**
2008	105,279	8,773	32,563	2,714	31%
2009	146,141	12,178	22,720	1,893	16%
2010	157,930	13,161	52,017	4,335	33%
2011	137,259	11,438	34,002	2,834	25%
2012[1]	122,331	10,194	22,768	1,897	19%

Source: North Carolina Marine Fisheries Division, 2012.
[1]Data for 2012 are preliminary and include only January through August.

Table 4.3.5. Annual landings of gag and red grouper on red grouper "target" trips off North Carolina from 2008 through 2011.
Red grouper "target" trip = trip landing >200 lbs of red grouper. Landings in pounds whole weight.

Year	**Gag**		**Red Grouper**		**Percent gag per trip**
	Total Landings	**Average Landings**	**Total Landings**	**Average Landings**	
2008	43,652	3,638	388,119	32,343	11%
2009	30,621	2,552	232,617	19,385	13%
2010	52,182	4,349	189,994	15,833	27%
2011	36,578	3,048	117,600	9,800	31%
2012	26,003	2,167	71,332	5,944	36%

Source: North Carolina Marine Fisheries Division, 2012.
[1]Data for 2012 are preliminary and include only January through August.

Preferred Alternative 3 is similar to **Alternative 2** in that the prohibition on harvest of all shallow water groupers when the gag ACL is met or projected to be met would be removed. However, **Preferred Alternative 3** includes an adjustment to the current commercial gag ACL to account for discard mortality after the closure. The current commercial ACL for gag was specified originally in Amendment 16 (SAFMC 2009a). However, the ACL was lowered by 1,000 lbs gw to account for "post-quota bycatch mortality" (PQBM). This adjustment in the ACL was intended to account for dead discards of gag that might occur after the gag quota was met. Hence, the ACL (previously referred to as Total Allowable Catch or TAC) was decreased by that amount and constitutes the current commercial ACL of 352,940 lbs gw. The January-April annual closure of shallow water groupers and the adjusted ACL are still in place. **Preferred Alternative 3** proposes to further reduce the commercial ACL for gag to account for any discard mortality that would result from targeting other shallow water groupers after commercial harvest of gag is prohibited.

Results of similar analyses to those conducted during development of Amendment 16 (SAFMC 2009a) and submitted by the NMFS Southeast Regional Office in support of this amendment (see **Appendix E** for full report) are summarized in **Table 4.3.6**. The average gutted weight of gag discarded dead between the end of October and the end of December were calculated. These months were chosen because the 2012 closure went into effect on October 20. Note that the analyses in Amendment 16 defined a target gag trip as one where 75% or more of the landings constituted gag. Further, Amendment 16 assumed 20% of the trips would not be taken after a gag closure occurred based on information from the Snapper Grouper AP and other fishermen.

An analysis was conducted to determine the pounds of gag lost from discard mortality if eliminated target trips still occurred but instead of targeting gag they fished for the other shallow water groupers. This required the average pounds of gag caught per trip to be calculated for non-target gag trips. The pounds of gag per trip displayed a log-normal distribution. Therefore, the geometric average was calculated instead of the commonly used arithmetic average because the geometric average is a better measure of central tendency with log-normally distributed data. The geometric average of the pounds of gag per trip was multiplied against the number of gag target trips to provide the pounds of gag that could be landed if gag target trips switched to fishing for other shallow water groupers. The discard mortality rate of 40% was applied to the pounds of gag caught to estimate dead discards in pounds. Additionally, during development of Amendment 16 (SAFMC 2009a), the Snapper Grouper AP and other fishermen reported that their trips would be reduced by 20% after a gag quota closure. To get an additional estimate of dead discards, target trips were decreased by 20% to estimate pounds of gag lost to discard mortality. Total dead discards in pounds were calculated by combining the pounds of gag lost to discard mortality from non-target trips with the pounds of gag lost to discard mortality from target trips switching to target other shallow water grouper. **Table 4.3.6** provides a summary of the calculations.

Table 4.3.6. South Atlantic gag landings and estimated dead discards from October 21 to December 31, 2011, with gag target trips removed.
Gag target trips were defined as trips where >90%, >75%, >50%, and >25% of the shallow water grouper landings came from gag. All pounds are in gutted weight. Release mortality rate is 40%.

Gag Target Trip Criteria	Trips Switching to Targeting SASWG*	Non-Target Trips Taken*	Pounds of Gag Caught from Switching Gag Target trips to the other shallow water groupers	Pounds of Gag caught from Non-Target Gag Trips	Total Pounds of Gag Lost to Discard Mortality
>90%	198	203	30,286	58,647	35,573
>75%	**232**	**160**	**29,260**	**38,785**	**27,218**
>50%	297	79	19,983	9,746	11,892
>25%	334	32	12,774	1,900	5,870

Source: NMFS SERO
*73 trips catching 18,936 pounds gutted weight of gag using spear were removed

If the definition of a gag "target" trip is maintained at the level used in Amendment 16 (SAFMC 2009a), then the average discard mortality of gag under **Alternative 1 (No Action)** would be 27,218 lbs

gw. Therefore, the adjusted gag ACL that accounts for PQBM when fishermen target other SASWG species would be 353,940 – 27,217 = 326,722 lbs gw. As **Preferred Alternative 3** proposes to further reduce the commercial ACL for gag to account for any discard mortality of gag that would result from targeting other shallow water groupers after the gag quota is met, this alternative would be expected to have a greater biological benefit for gag than **Alternative 2** or **Alternative 1 (No Action)**. **Alternatives 2** and **3 (Preferred)** would have a decreased biological effect for other shallow water grouper species since harvest could continue after the gag quota had been met. However, ACLs are in place for the other shallow water grouper species, which would ensure overfishing of these species did not occur and harvest was maintained at sustainable levels.

The biological benefits to the protected species most likely to interact with snapper grouper hook-and-line gear (e.g., sea turtles and smalltooth sawfish) from these alternatives are unclear. The primary biological benefits to these species are related to how each alternative may change the overall amount of fishing effort. In general, more fishing effort increases the potential for interactions; less fishing effort decreases the potential for interactions and is considered a greater biological benefit. However, if effort simply shifts in response to these alternatives, and does not actually increase or decrease, then the realized biological benefits from these alternatives may be minimal. Assuming changes in fishing effort actually occur in response to these alternatives, **Alternative 1 (No Action)** would likely have the greatest benefit to sea turtles and smalltooth sawfish since the current shallow water grouper closure likely reduces fishing effort. **Alternative 2** is likely to have the fewest biological benefits because it would remove the closure while maintaining the same ACL. **Preferred Alternative 3** may have greater biological benefit than **Alternative 2**. While it removes the shallow water grouper closure, it does reduce the gag grouper ACL, which could translate to less fishing effort and a greater biological benefit to sea turtles and smalltooth sawfish.

4.3.2 Economic Effects

Because of the many recent regulatory changes in the snapper grouper fishery and their resulting effects, vessel operations and industry structure changed considerably from 2007 through 2011 and into 2012 and beyond. Thus, the ability to project future trends based on previous years' data has become severely limited. Further, since 2012 data are not currently available, only 2011 data are used to analyze the direct economic effects of this action as they are the most recent and currently available data.

Alternative 1 (No Action) would retain the AM, which would close the entire shallow water grouper complex if the commercial ACL for gag is met or projected to be met. In 2012, such a closure occurred on October 20. According to the 2011 logbook data, 4,453 snapper grouper commercial trips occurred between October 20 and December 31. The gross revenue from these trips was $4,726,883. Of these 4,453 trips, 510 trips targeted species in the SASWG complex, where the trip's target species is represented by the species accounting for the highest proportion of gross revenue on the trip. The total gross revenue from landings of all species on these trips was $1,209,990. It is assumed these trips did not occur in 2012 as a result of the closure and would not occur in the future if the AM remains as is. In addition, landings of gag from trips targeting species other than SASWG accounted for an additional $29,960 in gross revenue. Thus, the total loss in gross revenue under **Alternative 1 (No Action)** is estimated to be $1,239,950.

Under **Alternative 2**, it is assumed the trips targeting SASWG that were canceled under **Alternative 1 (No Action)** would have occurred unless they targeted gag. That is, trips targeting gag would still be canceled under **Alternative 2**. There were 336 trips that targeted gag between October 20 and December 31, 2011. The gross revenue from all species on those trips was $901,544. In addition, landings of gag from trips targeting species other than gag and SASWG would also not be retained under **Alternative 2**. These landings accounted for an additional $74,563 in gross revenue. Thus, the loss in gross revenue under **Alternative 2** is estimated to be $976,107 in absolute terms. However, relative to **Alternative 1 (No Action)**, **Alternative 2** would result in a gain of $263,843 in gross revenue.

Under **Preferred Alternative 3**, the AM would be the same as under **Alternative 2**, which would result in a gain of $263,843 in gross revenue relative to **Alternative 1 (No Action)**. However, the reduction in the ACL would partially offset that gain. Specifically, a lower ACL would be expected to cause an earlier closure of gag than under **Alternative 1 (No Action)** and **Alternative 2**. Due to the lack of 2012 data, combined with the fact that the commercial ACL was exceeded in December of 2011, it is not possible to accurately predict how much earlier that closure would occur based on currently available data. Thus, a simpler approach to estimating the loss in gross revenue due to the reduced ACL is employed. Specifically, the difference between the current and proposed ACL is 26,218 lbs gw. Given an average price of $5.42/lb for gag in 2011, the loss in landings due to the reduced ACL is estimated to cause a loss in gross revenue of $142,102. The loss in gross revenue would be greater if the lower ACL causes the cancelation of trips targeting gag and the loss of all gross revenue from species harvested on those trips. Since the losses associated with the potential cancelation of those trips cannot be estimated with currently available data, the net gain in gross revenue under **Preferred Alternative 3** relative to **Alternative 1 (No Action)** is $121,741.

Since the ACL would not be reduced under **Alternative 2**, the gain in gross revenue under **Alternative 2** would be $142,102 greater than under **Preferred Alternative 3** (i.e., the full $263,843). Thus, economic benefits are greatest under **Alternative 2**, followed by **Preferred Alternative 3**, and least under **Alternative 1 (No Action).**

4.3.3 Social Effects

Since the analysis in **Section 4.3.1** suggests that the incidental catch of gag may not be significant when fishermen target other shallow water grouper species, **Alternative 1 (No Action)** may have negative social effects as fishermen participating in the commercial component of the snapper grouper fishery are experiencing other closures as a result of recently implemented ACLs and may need as much flexibility as possible. **Alternative 2** modifies the AM to allow harvest of shallow water grouper when gag closes and should have social benefits, as the continued harvest of these species would provide important revenues and prevent changes in fishing patterns. The reduction in the gag commercial ACL as a result of anticipated discards coming from continued harvest of shallow water grouper in **Preferred Alternative 3** may have negative effects on gag fishermen, but should provide more protection for the stock and therefore be positive in the long-term. **Preferred Alternative 3** would best minimize negative biological effects for gag while having positive social effects for those individuals who would want to target other shallow water grouper species after the gag quota was met. Overall, the South Atlantic Council's choice to modify the AM to allow for harvest may result in social benefits in that stakeholders would see responsive management when science suggests flexibility can be afforded.

4.3.4 Administrative Effects

The administrative effects of **Alternatives 2** and **3** (**Preferred)** could be slightly greater than **Alternative 1 (No Action)** because additional closures for species with individual ACLs could occur. The administrative burden is less when harvest for all shallow water grouper species is prohibited when the gag quota is met.

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

5.1 Action 1. Revise Annual Catch Limit (ACL) and Optimum Yield (OY) for Yellowtail Snapper

Snapper Grouper Advisory Panel (AP) Comments and Recommendations

The AP reviewed Regulatory Amendment 15 during their November 7-8, 2012 meeting in Charleston, South Carolina. Based on the South Atlantic Fishery Management Council's (South Atlantic Council) precedent of setting the ACL at the same level as the acceptable biological catch (ABC), the AP supported **Alternative 2** as preferred under **Action 1**. This alternative would adjust the yellowtail snapper ACLs and recreational ACT as follows:

Preferred Alternative 2. For yellowtail snapper, set ACL = OY = ABC based on results from new stock assessment (FWRI 2012).

Commercial ACL = 1,596,510
Recreational ACL = 1,440,990
Recreational ACT = 1,253,661
(all values pounds whole weight and landings only)

However, some members of the AP were of the opinion that the ACL should be more conservative, as proposed under **Alternatives 3** and **4**, especially for a stock that is healthy and is having its ACL increased by a substantial amount.

The South Atlantic Council chairman, who was in attendance observing the AP meeting, informed the AP about a request from a number of yellowtail snapper fishermen, who attended the September 2012 South Atlantic Council meeting, to re-evaluate the inter-jurisdictional allocation of the yellowtail harvest between the South Atlantic and Gulf of Mexico. The fishermen maintained that the allocation to the South Atlantic needed to be higher than the current one of 75% because Gulf of Mexico catches of yellowtail snapper are substantially below 25%. The South Atlantic Council chairman stated that an inter-council committee between the Gulf of Mexico and the South Atlantic would be convened in 2013 to address a range of management issues in South Florida where problems exist with species being caught on both sides of Florida, including yellowtail snapper.

In response, one AP member commented that only a small harvest of yellowtail snapper currently takes place in the Gulf of Mexico anymore. He stated that years ago, before the Dry Tortugas Reserve was created, there was a sizeable yellowtail snapper fleet out of Key West that fished off the Tortugas in the Gulf of Mexico. However, the fishing grounds north of the Dry Tortugas Bank are now closed to fishing. He maintained that there are some areas in the Gulf of Mexico where yellowtail snapper are still caught, but the harvest is considerably less than it was 15 years ago.

Law Enforcement Advisory Panel (LEAP) Comments and Recommendations

The LEAP did not review the amendment at a regularly scheduled meeting. However, the amendment was sent to the LEAP for review via e-mail. No comments or recommendations were received.

Scientific and Statistical Committee (SSC) Comments and Recommendations

The SSC received an overview of the amendment at their October 23-25, 2012, meeting in Charleston, South Carolina. SSC members had no specific comments or recommendations pertaining to **Action 1**.

South Atlantic Council's Choice for Preferred Alternative

The South Atlantic Council selected **Alternative 2** as preferred for Action 1. The alternative would specify the following for yellowtail snapper in the South Atlantic until modified:

Preferred Alternative 2. For yellowtail snapper, set ACL = OY = ABC based on results from new stock assessment (FWRI 2012).

Commercial ACL = 1,596,510
Recreational ACL = 1,440,990
Recreational ACT = 1,253,661

(all values pounds whole weight and landings only)

This choice is consistent with how the South Atlantic Council has chosen to specify ACL and OY for other snapper grouper species. Additionally, the alternative is the same as what was put in place via temporary emergency rule to adjust the commercial ACL for yellowtail snapper. The South Atlantic Council concluded **Preferred Alternative 2** best meets the purpose of modifying the existing specification of OY and ACL for yellowtail snapper in the South Atlantic Council's area of authority and addresses the need to ensure the yellowtail snapper ACLs are based upon the best available science. Further, **Preferred Alternative 2** enhances socioeconomic benefits to fishermen and fishing communities that utilize the yellowtail snapper resource. **Preferred Alternative 2** also best meets the objectives of the Snapper Grouper FMP, as amended, while complying with the requirements of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) and other applicable law.

5.2 Action 2. Yellowtail Snapper: Commercial and Recreational Fishing Year and Commercial Spawning Season Closure

Snapper Grouper Advisory Panel Comments and Recommendations

The AP supported **Alternative 1 (No Action)** for **Action 2**. This alternative would require no changes to the current commercial and recreational fishing years, which are the calendar year. **Preferred Alternative 1 (No Action)** would also not establish a yellowtail snapper spawning season closure for the commercial sector.

One of the commercial yellowtail snapper fishermen on the AP stated that in South Florida, a start date of January 1 is most advantageous since the season between Christmas and the end of March is when there is most demand for yellowtail snapper. Regarding the option for a spawning closure for the commercial sector, AP members stated that the industry is not against spawning season closures, when they are truly necessary. However, according to fishermen, yellowtail snapper spawn from off Miami to the Dry Tortugas and on the wrecks in the Gulf of Mexico and they are found is spawning condition throughout the year. Fishermen have stated that yellowtail snapper do not form large spawning

aggregations like mutton snapper are known to do. In addition, the AP offered that if spawning season closures are considered again in the future, they should apply to all sectors. A suggestion was made during the discussion to perhaps consider a reduction in the recreational bag limit during months of peak spawning. However, AP members agreed that, during the summer months, fishing pressure decreases substantially from that during February and March, the peak of the tourist season in South Florida.

Law Enforcement Advisory Panel Comments and Recommendations

The LEAP did not review the amendment at a regularly scheduled meeting. However, the amendment was sent to the LEAP for review via e-mail. No comments or recommendations were received.

Scientific and Statistical Committee Comments and Recommendations

The SSC noted that changing the fishing year would present issues with the stock assessment and they recommended that the fishing year remain unchanged until the effects of the ACL increase could be evaluated.

South Atlantic Council's Choice for Preferred Alternative

The South Atlantic Council selected **Alternative 1 (No Action)** as preferred for **Action 2**. This choice would require no changes to the current commercial and recreational fishing years, which are the calendar year. Also, **Preferred Alternative 1 (No Action)** would not establish a yellowtail snapper spawning season closure for the commercial sector. South Atlantic Council members expressed similar concerns to the SSC regarding problems with conducting future stock assessments. Further problems would occur if the fishing year in the South Atlantic differed from that in the Gulf of Mexico. In fact, the National Marine Fisheries Service (NMFS) Southeast Regional Office stated a preference for a single ACL that would apply to both the South Atlantic and Gulf Council's areas of authority. The South Atlantic Council reiterated the intent to participate on an inter-Council committee created specifically to address management of fisheries in south Florida. The South Atlantic Council acknowledged that the request for a change in the fishing year and a spawning season closure had come from the industry; however, the South Atlantic Council decided that no changes were needed at this time, especially since the new committee would be addressing issues in south Florida fisheries in 2013. The South Atlantic Council concluded **Preferred Alternative 1 (No Action)** best meets the purpose and need to consider modifications to management measures for yellowtail snapper to provide protection during the spawning season. **Preferred Alternative 1 (No Action)** also best meets the objectives of the Snapper Grouper FMP, as amended, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

5.3 Action 3. Gag and Shallow Water Groupers: Commercial Annual Catch Limit and Accountability Measures

Snapper Grouper Advisory Panel Comments and Recommendations

The AP supported **Alternative 3** as the preferred. This alternative would remove the accountability measure (AM) for gag that prohibits harvest of all shallow-water grouper once the commercial gag ACL has been landed or is projected to be landed. Instead, **Preferred Alternative 3** would maintain the in-season AM (closing the commercial fishery when the ACL is met or projected to be met) ***and*** to reduce the gag commercial ACL to account for gag discard mortality from commercial trips that target co-occurring species (i.e., red grouper and scamp) following a gag closure.

AP members from North Carolina stated that a small number of vessels target gag exclusively off North Carolina, in the Onslow Bay area. Additionally, AP members maintained that divers utilizing spearfishing gear land a substantial amount of gag and very few vessels reached the trip limit amount of 1,000 pounds gutted weight in 2012. The AP discussed other options to promote the full harvest of the gag ACL and extend the season and approved a motion to consider an accountability measure that would reduce the commercial trip limit for gag to 300 pounds gutted weight once 75% of the ACL is landed.

Law Enforcement Advisory Panel Comments and Recommendations

The LEAP did not review the amendment at a regularly scheduled meeting. However, the amendment was sent to the LEAP for review via e-mail. No comments or recommendations were received.

Scientific and Statistical Committee Comments and Recommendations

The SSC noted that several lines of evidence indicate that red grouper can be targeted without overly impacting gag. Therefore, the SSC had no concerns with the South Atlantic Council moving forward with the grouper actions proposed in Regulatory Amendment 15.

South Atlantic Council's Choice for Preferred Alternative

The South Council selected **Alternative 3** under **Action 3** as the preferred. This alternative would remove the AM for gag that prohibits harvest of all shallow-water grouper once the commercial gag ACL has been landed or is projected to be landed. Instead, **Preferred Alternative 3** proposes to prohibit commercial harvest of gag for the remainder of the fishing year once the ACL is met or projected to be met ***and*** reduce the unadjusted gag commercial ACL from 353,940 pounds gutted weight to 326,722 pounds gutted weight to account for projected gag discard mortality from commercial trips that target co-occurring species (i.e., red grouper and scamp) following a gag closure.

The South Atlantic Council reasoned that recent closures of other snapper grouper species due to meeting their respective ACLs have likely contributed to the observed reduction in gag discards. Moreover, fishing effort over the past few years has gone down, which has probably also resulted in less bycatch of gag (and other snapper grouper species). In addition, **Preferred Alternative 3** includes a measure to account for gag discards following a closure of the commercial sector, so the South Atlantic Council concluded that removal of the current accountability measure could be accomplished while maintaining the goal of ending overfishing of gag. Also, the predicted socio-economic benefits from fully harvesting the ACL (and OY) for the remainder of the shallow-water groupers are likely to offset the reduction in the gag ACL to account for post-quota bycatch mortality. The AP's suggestion for the step-down trip limit

was discussed but the Snapper Grouper Committee did not want to recommend adding a new alternative since that would delay submission of the amendment for formal review. Instead, the Snapper Grouper Committee stated that they would be willing to consider such an action in Regulatory Amendment 14, which will be developed in 2013. The South Atlantic Council concluded **Preferred Alternative 3** best meets the purpose and need to consider revisions to the existing accountability measure for gag while maintaining the goal of ending overfishing for gag and enhancing socio-economic benefits to fishermen and fishing communities that utilize the shallow-water grouper portion of the snapper grouper fishery. **Preferred Alternative 3** also best meets the objectives of the Snapper Grouper FMP, as amended, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

Chapter 6. Cumulative Effects

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

Various approaches for assessing cumulative effects have been identified, including checklists, matrices, indices, and detailed models (MacDonald 2000). The Council on Environmental Quality (CEQ) offers guidance on conducting a Cumulative Effects Analysis (CEA) in a report titled "Considering Cumulative Effects under the National Environmental Policy Act" (CEQ 1997). The report outlines 11 items for consideration in drafting a CEA for a proposed action.

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

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

6.1 Biological

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

The Council on Environmental Quality (CEQ) cumulative effects guidance states that this step is done through three activities. The three activities and the location in the document are as follows:

I. The direct and indirect effects of the proposed actions **(Chapter 4)**;

II. Which resources, ecosystems, and human communities are affected **(Chapter 3)**; and

III. Which effects are important from a cumulative effects perspective **(information revealed in this Cumulative Effects Analysis (CEA))**

2. Establish the geographic scope of the analysis.

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

3. Establish the timeframe for the analysis.

Establishing a timeframe for the CEA is important when the past, present, and reasonably foreseeable future actions are discussed. It would be advantageous to go back to a time when there was a natural, or some modified (but ecologically sustainable) condition. However, data collection for many fisheries began when species were already fully exploited. Therefore, the timeframe for analyses should be initiated when data collection began for the various fisheries to at least the present. In determining how far into the future to analyze cumulative effects, the length of the effects will depend on any reasonably foreseeable future actions involving yellowtail snapper; none are currently planned. Long-term evaluation is needed to determine if management measures have the intended effect of improving stock status.

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

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

I. Fishery-related actions affecting yellowtail snapper, gag, scamp, red grouper, black grouper, red hind, rock hind, yellowmouth grouper, yellowfin grouper, coney, and graysby

A. Past

The reader is referred to **Appendix D** (History of Management**)** of this document for past regulatory activity for the fish species. These include bag and size limits, spawning season closures, commercial quotas, gear prohibitions and limitations, area closures, and a commercial limited access system.

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

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

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

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

deepwater snapper grouper species (snowy grouper, blueline tilefish, yellowedge grouper, misty grouper, queen snapper, and silk snapper) at depths greater than 240 feet. The intent of this measure was to reduce bycatch of speckled hind and warsaw grouper. The South Atlantic Council approved Amendment 17B at their September 2010 meeting. The final rule published in the *Federal Register* on December 30, 2010, and became effective on January 31, 2011.

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

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

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

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

Amendment 20A (SAFMC 2012b) distributes shares from inactive participants in the wreckfish individual transferable quota to active shareholders. The South Atlantic Council approved Amendment 20A in December 2011. The final rule for Amendment 20A published in the *Federal Register* on September 26, 2012, and become effective on October 26, 2012.

Regulatory Amendment 12 (SAFMC 2012c) includes alternatives to adjust the golden tilefish ACL based on the results of a new assessment, which indicates golden tilefish are no longer experiencing overfishing and are not overfished. Regulatory Amendment 12 also includes an action to adjust the recreational AM. Regulatory Amendment 12 was approved for submission to the Secretary of Commerce by the South Atlantic Council at their March 2012 meeting. The Final Rule published in the *Federal Register* on October 9, 2012 and was effective upon publication.

In a letter dated June 19, 2012, the South Atlantic Council requested NMFS to allow harvest and possession of red snapper in 2012 through emergency regulations. At their June 11-15, 2012, meeting, the South Atlantic Council reviewed new information in the form of red snapper rebuilding projections, 2012 acceptable biological catch levels, and 2012 discard mortality levels. After accounting for the 2012 discard mortalities, the South Atlantic Council determined that directed harvest could be allowed without compromising the rebuilding of the stock to target levels. The *Federal Register* announced the opening of the 2012 commercial and recreational red snapper fishing season in South Atlantic federal waters on August 28, 2012. The commercial red snapper season opened at 12:01 a.m., local time, on September 17, 2012, and closed at 12:01 a.m., local time, on September 24, 2012. The recreational red snapper season opened at 12:01 a.m., local time, on September 14, 2012, and closed at 12:01 a.m., local time, on September 17, 2012; the season then reopened at 12:01 a.m., local time, on September 21, 2012, and closed at 12:01 a.m., local time, on September 24, 2012.

B. Present

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

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

C. Reasonably Foreseeable Future

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

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

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

At their March 2012 meeting, the South Atlantic Council requested development of a new regulatory amendment to allow for adjustment of allocations and ACLs based on the new landings information from

the Marine Recreational Information Program. Regulatory Amendment 13 is being developed to accomplish this adjustment. The amendment was submitted in December 2012.

At their June 2012 meeting, the South Atlantic Council requested development of a regulatory amendment to adjust management measures for greater amberjack, vermilion snapper, black sea bass, gray triggerfish, vermilion snapper, hogfish, and red porgy. These measures will be analyzed in 2013 through Regulatory Amendment 14.

At their September 2012 meeting, the South Atlantic Council requested development of Regulatory Amendment 16 to adjust management measures for golden tilefish. The South Atlantic Council will review an options paper in March 2013.

At their September 2012 meeting, the South Atlantic Council requested development of a Regulatory Amendment 17 to consider marine protected areas to provide additional protection for speckled hind and warsaw grouper. This action was previously considered in CE-BA 3. The South Atlantic Council will discuss the regulatory amendment in March 2013.

Regulatory Amendment 18 is being developed by the South Atlantic Council to adjust ACLs for vermilion snapper and red porgy based on the results of recent stock assessment updates. It will be approved for formal review at the March 2013 Council meeting.

At their September 2012 meeting, the South Atlantic Council directed staff to develop Amendment 27 to address issues related to the harvest and sale of blue runner by mackerel fisheremen, and extension of management into the Gulf of Mexico for Nassau grouper, yellowtail snapper, and mutton snapper. However, actions addressing yellowtail snapper and mutton snapper were removed from Amendment 27 pending discussions between the South Atlantic Council and the Gulf Council to address management of South Florida fisheries. In December 2012, the South Atlantic Council added two actions to Amendment 27: an action to modify the crew size limit for vessels with both a commercial permit and a charter/headboat permit (dual-permitted vessels), and an action to address the prohibition of bag limit quantities of certain snapper grouper species by captain and crew of for-hire vessels. The amendment will be approved for formal review in March 2013.

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

A. Past
B. Present
C. Reasonably foreseeable future

In terms of natural disturbances, it is difficult to determine the effect of non-Council and non-fishery related actions on stocks of snapper grouper species. Annual variability in natural conditions such as water temperature, currents, food availability, predator abundance, etc. can affect the abundance of young fish, which survive the egg and larval stages each year to become juveniles (i.e., recruitment). This natural variability in year class strength is difficult to predict as it is a function of many interactive and synergistic factors that cannot all be measured (Rothschild 1986). Furthermore, natural factors such as

storms, red tide, cold water upwelling, etc. can affect the survival of juvenile and adult fishes; however, it is very difficult to quantify the magnitude of mortality these factors may have on a stock. Alteration of preferred habitats for snapper grouper species could affect survival of fish at any stage in their life cycles. However, estimates of the abundance of fish, which utilize any number of preferred habitats, as well as, determining the impact habitat alteration may have on snapper grouper species, is problematic.

The snapper grouper ecosystem includes many species, which occupy the same habitat at the same time. For example, gag are most commonly taken with red porgy, red snapper, vermilion snapper, gray triggerfish, red grouper, scamp, and almaco jack and are not commonly taken with many shallow water grouper species (black grouper, rock hind, red hind, coney, graysby, yellowfin grouper, and yellowmouth grouper). Other natural events such as spawning seasons and aggregations of fish in spawning condition can make some species especially vulnerable to targeted fishing pressure. Such natural behaviors are discussed in further detail in **Chapters 3** and **4** of this document, which is hereby incorporated by reference.

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

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

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

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

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

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

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

Fish populations

A new stock assessment for yellowtail snapper was completed by the Florida Fish and Wildlife Conservation Commission's Fish and Wildlife Research Institute (FWRI) in May 2012 (FWRI 2012), and reviewed by the Center for Independent Experts. The new assessment indicates that the stock is not overfished and it is not undergoing overfishing. The assessment was reviewed by the South Atlantic Council's and Gulf Mexico Fishery Management Council's Scientific and Statistical Committees (SSC) on October 10, 2012. The SSCs recommended the acceptable biological catch for yellowtail snapper in the South Atlantic and Gulf of Mexico could increase to 4.13 million pounds whole weight based on the 2012 assessment. Regulatory Amendment 15 would update the ACL for yellowtail in the South Atlantic based on the results of this new assessment.

A stock assessment of gag was conducted in 2006, using data through 2004 (SEDAR 10 2006). Results of that assessment indicated that the gag stock was undergoing overfishing but was not overfished as of 2004 (last year of data in the stock assessment). The South Atlantic Council took action to end overfishing of gag through Amendment 16 (SAFMC 2009a). The amendment included measures to reduce the aggregate bag limit for groupers and tilefish; reduce the bag limit for gag or black grouper combined; establish a four-month spawning season closure; establish a quota for the commercial harvest of gag; and establish restrictions on the possession, sale, and purchase of gag and associated shallow water grouper species after the gag quota was met.

The South Atlantic stock of red grouper was assessed in 2009, using data through 2008 (SEDAR 19 2010). The assessment results indicated South Atlantic red grouper to be overfished and undergoing overfishing. Prior to the completion of SEDAR 19, however, Amendment 16 (SAFMC 2009a) put in place a four-month spawning season closure for gag and shallow water groupers (including red grouper), that was sufficient to end overfishing of red grouper. Amendment 24 to the Snapper Grouper FMP (SAFMC 2011d) established a rebuilding plan for red grouper and put in place AMs for both the recreational and commercial sectors. Amendment 24 was implemented in June 2012.

Black grouper were assessed, along with red grouper, through SEDAR 19 (2010), utilizing data through 2008. The assessment determined the black grouper stock was not undergoing overfishing and was not overfished.

Scamp are not undergoing overfishing and are not overfished. The species was last assessed in 1998 using virtual population analysis (Manooch et al. 1998). The status of the remaining species is unknown. For details on the life histories of other shallow water groupers (red hind, rock hind, yellowmouth grouper, yellowfin grouper, coney, and graysby) refer to Volume II of the Fishery Ecosystem Plan (SAFMC 2009b) available at:
http://www.safmc.net/ecosystem/Home/EcosystemHome/tabid/435/Default.aspx.

Climate change

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

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

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

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

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

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

Table 6.1.1. The cause and effect relationship of fishing and regulatory actions within the time period of the Cumulative Effects Analysis (CEA).

Time period/dates	Cause	Observed and/or Expected Effects
Pre-January 12, 1989	Habitat destruction, growth overfishing of vermilion snapper.	Damage to snapper grouper habitat, decreased yield per recruit of vermilion snapper.
January 1989	Trawl prohibition to harvest fish (SAFMC 1988a).	Increase yield per recruit of vermilion snapper; eliminate trawl damage to live bottom habitat.
Pre-January 1, 1992	Overfishing of many snapper grouper species.	Spawning stock ratio of these species is estimated to be less than 30% indicating that they are overfished.
January 1992	Prohibited gear: fish traps south of Cape Canaveral, FL; entanglement nets; longline gear inside of 50 fathoms; powerheads and bangsticks in designated SMZs off SC. Size/Bag limits: 10" TL vermilion snapper (recreational only); 12" TL vermilion snapper (commercial only); 10 vermilion snapper/person/day; aggregate grouper bag limit of 5/person/day; and 20" TL gag, red, black, scamp, yellowfin, and yellowmouth grouper size limit (SAFMC 1991).	Reduce mortality of snapper grouper species.
Pre-June 27, 1994	Damage to *Oculina* habitat.	Noticeable decrease in numbers and species diversity in areas of *Oculina* off FL
July 1994	Prohibition of fishing for and retention of snapper grouper species (HAPC renamed OECA; SAFMC 1993)	Initiated the recovery of snapper grouper species in OECA.
1992-1999	Declining trends in biomass and overfishing continue for a number of snapper grouper species including golden tilefish.	Spawning potential ratio for golden tilefish is less than 30% indicating that they are overfished.
July 1994	Commercial quota for golden tilefish; commercial trip limits for golden tilefish; include golden tilefish in grouper recreational aggregate bag limits (SAFMC 1994a).	
February 24, 1999	All S-G without a bag limit: aggregate recreational bag limit 20 fish/person/day, excluding tomtate and blue runners. Vessels with longline gear aboard may only possess snowy, Warsaw, yellowedge, and misty	

Time period/dates	Cause	Observed and/or Expected Effects
	grouper, and golden, blueline and sand tilefish (SAFMC 1998a).	
Effective October 23, 2006	Snapper grouper Amendment 13C (SAFMC 2006)	Commercial vermilion snapper quota set at 1.1 million lbs gw; recreational vermilion snapper size limit increased to 12" TL to prevent vermilion snapper overfishing.
Effective February 12, 2009	Amendment 14 (SAFMC 2007)	Use marine protected areas (MPAs) as a management tool to promote the optimum size, age, and genetic structure of slow growing, long-lived deepwater snapper grouper species (e.g., speckled hind, snowy grouper, warsaw grouper, yellowedge grouper, misty grouper, golden tilefish, blueline tilefish, and sand tilefish). Gag and vermilion snapper occur in some of these areas.
Effective March 20, 2008	Amendment 15A (SAFMC 2008a)	Establish rebuilding plans and SFA parameters for snowy grouper, black sea bass, and red porgy.
Effective Dates Dec 16, 2009, to Feb 16, 2010.	Amendment 15B (SAFMC 2008b)	End double counting in the commercial and recreational reporting systems by prohibiting the sale of bag-limit caught snapper grouper, and minimize impacts on sea turtles and smalltooth sawfish.
Effective Date July 29, 2009	Amendment 16 (SAFMC 2009a)	Protect spawning aggregations and snapper grouper in spawning condition by increasing the length of the spawning season closure, decrease discard mortality by requiring the use of dehooking tools, reduce overall harvest of gag and vermilion snapper to end overfishing.
Effective Date January 4, 2010	Red Snapper Interim Rule	Prohibit commercial and recreational harvest of red snapper from January 4, 2010, to June 2, 2010 with a possible 186-day extension. Reduce overfishing of red snapper while long-term measures to end overfishing are addressed in Amendment 17A.
Effective Dates June 3, 2010, to Dec 5, 2010	Extension of Red Snapper Interim Rule	Extended the prohibition of red snapper to reduce overfishing of red snapper while long-term measures to end overfishing are addressed in Amendment 17A.
Effective Date December 4, 2010	Amendment 17A (SAFMC 2010a).	Specified SFA parameters for red snapper; ACLs and ACTs; management measures to limit recreational and commercial sectors to their ACTs;

Time period/dates	Cause	Observed and/or Expected Effects
		accountability measures. Establish rebuilding plan for red snapper. Large snapper grouper area closure inn EEZ of NE Florida. Emergency rule delayed the effective date of the snapper grouper closure.
Effective Date January 31, 2011	Amendment 17B (SAFMC 2010b)	Specified ACLs and ACTs; management measures to limit recreational and commercial sectors to their ACTs; AMs, for species undergoing overfishing. Established a harvest prohibition of six snapper grouper species in depths greater than 240 feet.
Effective Date June 1, 2011	Regulatory Amendment 10 (SAFMC 2010c)	Removed of snapper grouper area closure approved in Amendment 17A.
Effective Date July 15, 2011	Regulatory Amendment 9 (SAFMC 2011a)	Harvest management measures for black sea bass; commercial trip limits for gag, vermilion and greater amberjack
Effective Date May 10, 2012	Regulatory Amendment 11 (SAFMC 2011b)	Removed the harvest prohibition of six deepwater snapper grouper species implemented in Amendment 17B.
Effective Date April 16, 2012	Comprehensive ACL Amendment (SAFMC 2011c)	ACLs ACTs, and AMs for species not experiencing overfishing; accountability measures; an action to remove species from the fishery management unit as appropriate; and management measures to limit recreational and commercial sectors to their ACTs.
July 11, 2012	Amendment 24 (Red Grouper) (SAFMC 2011d)	Established a rebuilding plan for red grouper, specified ABC, and established ACL, ACT and revised AMs for the commercial and recreational sectors.
Effective Date July 1, 2012	Amendment 18A (SAFMC 2012a)	Established an endorsement program for black sea bass commercial fishery; established a trip limit; specified requirements for deployment and retrieval of pots; made improvements to data reporting for commercial and for-hire sectors
Effective Dates: September 17, 2012 (commercial); September 14, 2012 (recreational)	Temporary Rule through Emergency Action (Red snapper)	Established limited red snapper fishing seasons (commercial and recreational) in 2012.

Time period/dates	Cause	Observed and/or Expected Effects
Effective Date January 7, 2013	Amendment 18A Transferability Amendment	Reconsidered action to allow for transfer of black sea bass pot endorsements that was disapproved in Amendment 18A.
Effective Date October 26, 2012	Amendment 20A (Wreckfish) (SAFMC 2012b)	Redistributed inactive wreckfish shares.
Effective Date October 9, 2012	Regulatory Amendment 12 (SAFMC 2012c)	Adjusted the golden tilefish ACL based on the results of a new stock assessment and modified the recreational golden tilefish AM.
Target 2013	Amendment 18B (under review)	Establish a commercial longline endorsement program for golden tilefish; establish an appeals process; allocate the commercial ACL by gear; establish trip limit for the hook-and-line sector
Target 2013	Amendment 22 (under development)	Develop a recreational tag program for red snapper and deepwater species (snowy grouper, golden tilefish and wreckfish) in the South Atlantic.
Target 2013	Regulatory Amendment 13 (under review)	Adjust ACLs and allocations for unassessed snapper grouper species with MRIP recreational estimates
Target 2013	Amendment 27 (under development)	Establish the SAFMC as the managing entity for yellowtail and mutton snappers and Nassau grouper in the Southeast U.S., modify the SG framework; modify placement of blue runner in an FMU or modify management measures for blue runner
Target 2013	Amendment 28 (under review)	Modify red snapper management measures, including the establishment of a process to determine future annual catch limits and fishing seasons.

9. Determine the magnitude and significance of cumulative effects.

When species in the snapper grouper fishery management unit are assessed, stock status may change as new information becomes available. In addition, changes in management regulations, fishing techniques, social/economic structure, etc. can result in shifts in the percentage of harvest between user groups over time. As such, the South Atlantic Council has determined that certain aspects of the current management system should be restructured. **Actions 1** and **3** are expected to have a beneficial effect on the bio-physical environment whereas **Action 2** proposes a management action that would likely have no impact on the biophysical environment. Furthermore, **Chapters 2** and **4** of this document--which considers modification to the commercial and/or recreational fishing years and a spawning season closure for yellowtail snapper, and removal of the accountability measure that requires a closure of all shallow

water groupers when the commercial ACL for gag is met--describe in detail the magnitude and significance of effects of the alternatives considered.

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

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

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

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

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

6.2 Socioeconomic

The overall cumulative social effects of the actions within this amendment should be positive. By increasing the yellowtail ACL and modifying the accountability measure for gag, fishermen should see benefits, at least in the short term. It is assumed that those communities identified in **Section 3.3.2** will benefit from the positive social effects of the regulatory actions. It is unlikely that there would be any negative social effects to other communities as a result. While these cumulative impacts are positive, the long term benefits of the actions contained within this amendment will need to be assessed with regard to the impact upon the stock status of the fishery and social environment overall. Changes in fishing behavior which may have short term positive impacts for one sector or fishery, can have differing impacts in others and therefore may have different long term impacts overall. While we assume these regulatory changes should have short term positive social impacts like improving fishing opportunities for both the recreational and commercial sectors and the associated socioeconomic benefits that follow to associated businesses and communities, we will not know the long term impacts until we have a better understanding of how behaviors are modified by these actions. With these actions, it is unlikely that any substantial long term negative impacts should occur as long as harvest for both sectors is monitored in a timely manner and ACLs are not exceeded. Overall perception of both the South Atlantic Council and NMFS should benefit from the actions that take into consideration some of the socioeconomic concerns that stakeholders expressed during previous regulatory action. This may have positive social effects of improving compliance and cooperation in future management.

Chapter 7. List of Preparers

Table 7.1.1. List of preparers of the document.

Name	Organization	Title
Myra Brouwer	SAFMC	IPT Lead/Fishery Scientist
Brian Cheuvront	SAFMC	Economist
Anik Clemens	NMFS/SF	Technical Writer Editor
Scott Crosson	NMFS/SF	Economist
Rick DeVictor	NMFS/SF	IPT Lead/Fishery Biologist
Mike Errigo	SAFMC	Fishery Biologist
Mike Jepson	NMFS/SF	Social Scientist
Mike Larkin	NMFS/SF	Fishery Biologist
Kari MacLauchlin	SAFMC	Social Scientist
Jack McGovern	NMFS/SF	Fishery Biologist
Monica Smit-Brunello	NOAA/GC	Attorney
Mike Travis	NMFS/SF	Economist
Gregg Waugh	SAFMC	Deputy Executive Director

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

Table 7.1.2. List of interdisciplinary plan team members for the document.

Name	Organization	Title
Myra Brouwer	SAFMC	IPT Lead/Fishery Scientist
Brian Cheuvront	SAFMC	Economist
Anik Clemens	NMFS/SF	Technical Writer Editor
Scott Crosson	NMFS/SF	Economist
David Dale	NMFS/HC	EFH Specialist
Rick DeVictor	NMFS/SF	IPT Lead/Fishery Biologist
Mike Errigo	SAFMC	Fishery Biologist
Andy Herndon	NMFS/PR	Fishery Biologist (Protected Resources)
Stephen Holiman	NMFS/SF	Economist
Mike Jepson	NMFS/SF	Social Scientist
David Keys	NMFS/SER	Regional NEPA Coordinator
Tony Lamberte	NMFS/SF	Economist
Mike Larkin	NMFS/SF	Fishery Biologist
Kari MacLauchlin	SAFMC	Social Scientist
Anna Martin	SAFMC	Fishery Scientist
Jack McGovern	NMFS/SF	Fishery Biologist
Roger Pugliese	SAFMC	Fishery Biologist
Monica Smit-Brunello	NOAA/GC	Attorney
Andy Strelcheck	NMFS/SF	Fishery Biologist
Mike Travis	NMFS/SF	Economist
Gregg Waugh	SAFMC	Deputy Executive Director

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

Chapter 8. Agencies and Persons Consulted

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

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

Chapter 9. References

Allen, G.R. 1985. FAO species catalogue. Vol. 6. Snappers of the world. An annotated and illustrated catalogue of lutjanid species known to date. FAO Fish. Synop. 6(125): 208 pp.

Bortone S.A. and J.L. Williams. 1986. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (south Florida): Gray, lane, mutton, and yellowtail snappers. Biological Report 82 (11.52). U.S. Fish and Wildlife Service. 18 p. U.S. Army Corps of Engineers TR EL-82-4.

Bullock L.H. and G.B. Smith. 1991. Seabasses (Pisces: Serranidae). Florida Marine Research Institute, St. Petersburg, FL. Memoirs of the Hourglass Cruises. 243 p.

Burgos, J.M. 2001. Life history of the red grouper (*Epinephelus morio*) off the North Carolina and South Carolina Coast. M.S. Thesis, University of Charleston. 90 pp.

Carter, J. and D. Perrine. 1994. A spawning aggregation of dog snapper, *Lutjanus jocu* (Pisces: Lutjanidae) in Belize, Central America. Bull. Mar. Sci. 55:228-234.

Carter, D. and C. Liese. 2012. The Economic Value of Catching and Keeping or Releasing Saltwater Sport Fish in the Southeast USA. North American Journal of Fisheries Management, 32:613-625.

CEQ (Council on Environmental Quality). 1997. Considering Cumulative Effects Under the National Environmental Policy Act. U.S. Council on Environmental Quality, Washington, DC. 64 pp.

Colburn, L.L. and M. Jepson. 2012. Social Indicators of Gentrification Pressure in Fishing Communities: A Context for Social Impact Assessment. Coastal Management 40(3): 289-300.

Coleman, F.C., C.C. Koenig, and L.A. Collins. 1996. Reproductive styles of shallow water groupers (Pisces: Serranidae) in the eastern Gulf of Mexico and the consequences of fishing on spawning aggregations. Env. Biol. Fishes 47: 129-141.

Crabtree, R.E. and L.H. Bullock. 1998. Age, growth, and reproduction of black grouper, *Mycteroperca bonaci*, in Florida waters. Fish. Bull. 96:735-753.

Dumas, C.F., J.C. Whitehead, C.E. Landry, and J.H. Herstine. 2009. Economic Impacts and Recreation Value of the North Carolina For-Hire Fishing Fleet. North Carolina Sea Grant FRG Grant Report 07-FEG-05.

Eklund, A.M., D.B. McClellan, and D.E. Harper. 2000. Black grouper aggregation in relation to protected areas within the Florida Keys National Marine Sanctuary. Bull. Mar. Sci. 66:721-728.

Erdman, D.S. 1976. Spawning patterns of fishes from the northeastern Caribbean. Agric. Fish. Contrib. Puerto Rico Department of Agriculture Vol. 8.

Figuerola, M, D. Matos-Caraballo, and W. Torres. 1997. Maturation and reproductive seasonality of four reef fish species in Puerto Rico. Proceedings of the Gulf Caribbean Fisheries Institute 50: 938-968.

FWRI (Fish and Wildlife Research Institute). 2012. The 2012 Stock Assessment Report for Yellowtail Snapper in the South Atlantic and Gulf of Mexico. Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute, 100 Eighth Ave Southeast, St. Petersburg, Florida 33701.

Gilmore, R.G. and R.S. Jones. 1992. Color variation and associated behavior in the epinepheline groupers, *Mycteroperca microlepis* (Goode and Bean) and *M. phenax* (Jordan and Swain). Bulletin of Marine Science 51: 83-103.

GMFMC (Gulf of Mexico Fishery Management Council). 2012. Joint SAMFC-GMFMC SSC Meeting Session – October 10, 2012. Gulf of Mexico Fishery Management Council, 2203 North Lois Avenue, Suite 1100; Tampa, FL 33607. 5 pp.

Grimes, C.B. 1987. Reproductive biology of the Lutjanidae: a review. Pages 239-294 in J. J. Polovina, and S. Ralston editors. Tropical snappers and groupers: biology and fisheries management. Westview Press, Boulder, CO.

Haab, T.C., R. Hicks, K. Schnier, and J.C. Whitehead. 2009. Angler Heterogeneity and the Species-Specific Demand for Recreational Fishing in the Southeastern United States. Draft Final Report Submitted for MARFIN Grant #NA06NMF4330055.

Harris, P.J. and M.R. Collins. 2000. A comparison of the age, growth, and age at maturity for gag, *Mycteroperca microlepis*, from the southeastern United States during 1976-1982 and 1994-1995. Bull. Mar. Sci. 66:105-117.

Harris, P.J., D.M. Wyanski, D.B. White, and J.L. Moore. 2002. Age, growth and reproduction of scamp, *Mycteroperca phenax*, in the southwestern North Atlantic 1979-1997. Bull. Mar. Sci. 70:113-132.

Heemstra, P.C. and J.E. Randall. 1993. FAO species catalogue. Vol. 16. Groupers of the world. (Family Serranidae, Subfamily Epinephelinae). An annotated and illustrated catalogue of the grouper, rockcod, hind, coral grouper and lyretail species known to date. FAO Fish. Synops. 16(125).

Holland, S.M., A.J. Fedler, and J.W. Milon. 1999. The Operation and Economics of the Charter and Headboat Fleets of the Eastern Gulf of Mexico and South Atlantic Coasts. University of Florida Office of research, Technology, and Graduate Education. Report prepared for the National Marine Fisheries Service. Grant Number NA77FF0553.

Holland, S.M., C. Oh, S.L. Larkin, and A.W. Hodges. 2012. The Operations and Economics of For-Hire Fishing Fleets of the South Atlantic States and the Atlantic Coast of Florida. Report prepared for the National Marine Fisheries Service. MARFIN Grant Number NA09NMF4330151.

Hood, P.B. and R.A. Schlieder. 1992. Age, growth, and reproduction of gag, *Mycteroperca microlepis* (Pisces: Serranidae), in the eastern Gulf of Mexico. Bull. Mar. Sci. 51(3):337-352.

Huntsman, G.R., J. Potts, R.W. Mays, and D. Vaughan. 1999. Groupers (Serranidae, Epinephelinae): Endangered Apex Predators of Reef Communities. Life in the Slow Lane: Ecology and Conservation of Long-Lived Marine Animals. pp. 217-231. American Fisheries Society Symposium. Vol. 23.

IPCC (Intergovernmental Panel on Climate Change). 2007. Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, Pachauri, R.K and Reisinger, A. (eds.)]. IPCC, Geneva, Switzerland, 104 pp.

Jacob, S., P. Weeks, B. Blount, and M. Jepson. 2012. Development and Evaluation of Social Indicators of Vulnerability and Resiliency for Fishing Communities in the Gulf of Mexico. Marine Policy 26(10):16-22.

Jepson, M., K. Kitner, A. Pitchon, W.W. Perry, and B. Stoffle. 2005. Potential fishing communities in the Carolinas, Georgia, and Florida: An effort in baseline profiling and mapping. NOAA Technical Report (available at http://sero.nmfs.noaa.gov/sf/socialsci/pdfs/SA%20Fishing%20Community%20Report.pdf)

Johnson, G.D. and P. Keener. 1984. Aid to identification of American grouper larvae. Bull. Mar. Sci. 34(l): 106 134.

Jory, D.E. and D.S. Iversen. 1989. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (south Florida). Black, red and Nassau groupers. Biol. Rep. US Fish Wildlife Serv., 30 pp.

Keener, P., G.D. Johnson, B.W. Stender, E.B. Brothers, and H.R. Beatty. 1988. Ingress of postlarval gag, *Mycteroperca microlepis* (Pisces: Serranidae), through a South Carolina barrier island inlet. Bull. Mar. Sci. 42(3): 376-396.

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

Koenig, C.C. and F.C. Coleman. 1998. Absolute abundance and survival of juvenile gag, *Myctoperca microlepis*, in seagrass beds of the N.E. Gulf of Mexico. Trans. Am. Fish. Soc. 127(1): 44-55.

Leland, J.G., III. 1968. A survey of the sturgeon fishery of South Carolina. Bears Bluff Labs. No. 47, 27 pp.

Liese, C., D.W. Carter, and R. Curtis. 2009. Surveying the For-Hire Sector: Economic Heterogeneity in the Southeast Charter Boat Industry. Submitted to the Proceedings of the 5th World Recreational Fishing Conference.

Lindeman K.C, R. Pugliese, G.T. Waugh, and J.S. Ault. 2000. Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bull. Mar. Sci. 66(3):929–956.

MacDonald, L.H. 2000. Evaluating and managing cumulative effects: process and constraints. Environmental Management 26(3): 299-315.

Manooch, C.S., III, and C.L. Drennon. 1987. Age and growth of yellowtail snapper and queen triggerfish collected from the U.S. Virgin Islands and Puerto Rico. Fisheries Research 6:53-68.

Manooch, C.S., III, J.C. Potts, M.L. Burton, and P.J. Harris. 1998. Population assessment of the scamp, *Mycteroperca phenax*, from the southeastern United States. NOAA Tech. Mem. NMFS-SEFSC-410, 57 p.

Matheson, R.H., III, G.R. Hunstsman, and C.S. Manooch, III. 1986. Age, growth, mortality, food and reproduction of the scamp, *Mycteroperca phenax*, collected off North Carolina and South Carolina. Bulletin of Marine Science 38:300-312.

McGovern, J.C., D.M. Wyanski, O. Pashuk, C.S. Manooch, III, and G.S. Sedberry. 1998. Changes in the sex ratio and size at maturity of gag, *Mycteroperca microlepis*, from the Atlantic coast of the southeastern United States during 1976-1995. Fish. Bull. 96:797-807.

McGovern, J.C., J.M. Burgos, P.J. Harris, G.R. Sedberry, J.K. Loefer, O. Pashuk, and D. Russ. 2002a. Aspects of the Life History of Red Grouper, *Epinephelus morio*, Along the Southeastern United States. MARFIN Final Report NA97FF0347.

McGovern, J.C., G.R. Sedberry, H.S. Meister, T.M. Westendorff, D.M. Wyanski, and P.J. Harris. 2005. A Tag and Recapture Study of Gag, *Mycteroperca microlepis*, from the Southeastern United States. Bulletin of Marine Science 76:47-59.

Moe, M.A., Jr. 1969. Biology of the red grouper *Epinephelus morio* (Valenciennes) from the eastern Gulf of Mexico. Florida Department of Natural Resources, Marine Resources Laboratory Professional Paper Series 10:1-95.

Mullaney, M.D., Jr. 1994. Ontogenetic shifts in diet of gag, *Mycteroperca microlepis*, (Goode and Bean), (Pisces:Serranidae). Proc. Gulf Carib. Fish. Inst. 43: 432-445.

Muller, R.G., M.D. Murphy, J. de Silva, and L.R. Barbieri. 2003. A stock assessment of yellowtail snapper, *Ocyrurus, chrysurus*, in the Southeast United states.
SEDAR 3 (Southeast Data, Assessment, and Review) Workshop. IHR 2003-10. 182 p. Fl. Fish Wild. Comm., Fl. Mar. Res. Inst., St. Petersburg, FL.

NMFS (National Marine Fisheries Service). 2009. Economic Value of Angler Catch and Keep in the Southeast United States: Evidence from a Choice Experiment. NOAA SEFSC SSRG.

NMFS (National Marine Fisheries Service). 2012. Gulf of Mexico 2011 Red Snapper

Individual Fishing Quota Annual Report. National Marine Fisheries Service. Southeast Regional Office, 263 13th Avenue South, St. Petersburg, FL 33701. Available at: http://sero.nmfs.noaa.gov/sf/ifq/2011_RS_AnnualReport_Final.pdf

Potts, J.C., C.S. Manooch, III, and D.S. Vaughan. 1998. Age and Growth of Vermilion Snapper from the Southeastern United States. Trans. Am. Fish. Soc. 127: 787-795.

Potts, J.C. and K. Brennan. 2001. Trends in catch data and static SPR values for 15 species of reef fish landed along the southeastern United States. Report for South Atlantic Fishery Management Council, Charleston, SC.

Ross, S.W., and M.L. Moser. 1995. Life history of juvenile gag, *Mycteroperca microlepis*, in North Carolina estuaries. Bulletin of Marine Science 56:222-237.

Rothschild, B.J. 1986. Dynamics of Marine Fish Populations. Harvard University Press. Cambridge, Massachusetts. 277pp.

SAFMC (South Atlantic Fishery Management Council). 1983. Fishery Management Plan, Regulatory Impact Review and Final Environmental Impact Statement for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Circle, Suite 306, Charleston, South Carolina, 29407-4699.

SAFMC (South Atlantic Fishery Management Council). 1987. Regulatory Amendment Number 1 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Cir., Ste. 306, Charleston, S.C. 29407-4699.

SAFMC (South Atlantic Fishery Management Council). 1988a. Amendment 1 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Assessment and Regulatory Impact Review. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 63 pp. with appendices.

SAFMC (South Atlantic Fishery Management Council). 1988b. Regulatory Amendment Number 2 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Cir., Ste. 306, Charleston, S.C. 29407-4699.

SAFMC (South Atlantic Fishery Management Council). 1991. Amendment 4 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Assessment, Initial Regulatory Flexibility Analysis, and Regulatory Impact Review. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 243 pp. with appendices.

SAFMC (South Atlantic Fishery Management Council). 1993. Amendment 6 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Assessment, Initial Regulatory Flexibility Analysis, and Regulatory Impact Review. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 161 pp. with appendices.

SAFMC (South Atlantic Fishery Management Council). 1994a. Amendment Number 7 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Cir., Ste 306, Charleston, S.C. 29407-4699.

SAFMC (South Atlantic Fishery Management Council). 1994b. Regulatory Amendment Number 6 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Cir., Ste. 306, Charleston, S.C. 29407-4699.

SAFMC (South Atlantic Fishery Management Council). 1998a. Amendment Number 9 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Cir., Ste 306, Charleston, S.C. 29407-4699.

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

SAFMC (South Atlantic Fishery Management Council). 1998c. Comprehensive Amendment Addressing Sustainable Fishery Act Definitions and Other Required Provisions in Fishery Management Plans of the South Atlantic Region (Amendment 11 to the Snapper Grouper FMP). South Atlantic Fishery Management Council, 1 Southpark Cir., Suite 306, Charleston, S.C. 29407-4699. 151 pp.

SAFMC (South Atlantic Fishery Management Council). 1998d. Comprehensive Amendment Addressing Essential Fish Habitat in Fishery Management Plans of the South Atlantic Region (Amendment 10 to the Snapper Grouper Fishery Management Plan). South Atlantic Fishery Management Council, 1 Southpark Cir., Suite 306, Charleston, S.C. 29407-4699.

SAFMC (South Atlantic Fishery Management Council). 2000. Amendment Number 12, Final Environmental Impact Statement, Initial Regulatory Flexibility Analysis/Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement for the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Cir., Ste 306, Charleston, S.C. 29407-4699.

SAFMC (South Atlantic Fishery Management Council). 2006. Amendment 13C to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Impact Statement, Biological Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 631 pp. with appendices.

SAFMC (South Atlantic Fishery Management Council). 2007. Amendment 14 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Impact Statement, Biological Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 601 pp. with appendices.

SAFMC (South Atlantic Fishery Management Council). 2008a. Amendment 15A to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Impact Statement, Biological Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 325 pp. with appendices.

SAFMC (South Atlantic Fishery Management Council). 2008b. Amendment 15B to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Impact Statement, Biological Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 324 pp. plus appendices.

SAFMC (South Atlantic Fishery Management Council). 2009a. Amendment 16 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Impact Statement, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 608 pp. plus appendices.

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

SAFMC (South Atlantic Fishery Management Council). 2009c. Comprehensive Ecosystem-based Amendment 1 with Final Environmental Impact Statement, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 287 pp. plus appendices.

SAFMC (South Atlantic Fishery Management Council). 2010a. Amendment 17A to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 385 pp. with appendices.

SAFMC (South Atlantic Fishery Management Council). 2010b. Amendment 17B to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 406 pp. plus appendices.

SAFMC (South Atlantic Fishery Management Council). 2010c. Regulatory Amendment 10 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and

Social Impact Assessment. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 101 pp. with appendices.

SAFMC (South Atlantic Fishery Management Council). 2011a. Regulatory Amendment 9 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2011b. Regulatory Amendment 11 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Assessment, Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 86 pp. plus appendices.

SAFMC (South Atlantic Fishery Management Council). 2011c. Comprehensive Annual Catch Limit Amendment for the South Atlantic Region with Final Environmental Impact Statement, Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 755 pp. plus appendices.

SAFMC (South Atlantic Fishery Management Council). 2011d. Amendment 24 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 256 pp. plus appendices.

SAFMC (South Atlantic Fishery Management Council). 2011e. Comprehensive Ecosystem-based Amendment 2 with Final Environmental Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 178 pages plus appendices.

SAFMC (South Atlantic Fishery Management Council). 2012a. Amendment 18A to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Impact Statement, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 292 pp. plus appendices.

SAFMC (South Atlantic Fishery Management Council). 2012b. Amendment 20A to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Assessment, Regulatory Flexibility Analysis, Regulatory Impact Review, and Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 128 pp. plus appendices.

SAFMC (South Atlantic Fishery Management Council). 2012c. Regulatory Amendment 12 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and

Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 106 pp. plus appendices.

Scott, W.B. and E.J. Crossman. 1973. Freshwater fishes of Canada. Fisheries Research Board of Canada Bulletin 184: 966 pp.

SEDAR (Southeast Data, Assessment, and Review) 3. 2003. Southeastern United States Yellowtail Snapper. Southeast Data, Assessment and Review, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405. Available at: http://www.sefsc.noaa.gov/sedar/

SEDAR (Southeast Data, Assessment, and Review) 10. 2006. South Atlantic and Gulf of Mexico Gag Grouper. Southeast Data, Assessment and Review, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405. Available at: http://www.sefsc.noaa.gov/sedar/

SEDAR (Southeast Data, Assessment, and Review) 19. 2010. South Atlantic and Gulf of Mexico Black Grouper and South Atlantic Red Grouper. Southeast Data, Assessment and Review, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405. Available at: http://www.sefsc.noaa.gov/sedar/

SEDAR (Southeast Data, Assessment, and Review) 24. 2010. South Atlantic Red Snapper. Southeast Data, Assessment and Review, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405. Available at: http://www.sefsc.noaa.gov/sedar/Sedar_Workshops.jsp?WorkshopNum=24

SERO (NOAA Fisheries Service Southeast Regional Office). 2010. Regulatory Amendment 11: Warsaw Grouper and Speckled Hind Catches in the U.S. South Atlantic. June 1, 2011 (revised August 23, 2011). SERO-LAPP-2011-06. 2011. 18 pp.

Sluka, R., M. Chiappone, and K.M. Sullivan. 1994. Comparison of juvenile grouper populations in southern Florida and the central Bahamas. Bull. Mar. Sci. 54:871-880.

Strelcheck, A.J., G.R. Fitzhugh, F.C. Coleman, and C.C. Koenig. 2003. Otolith: fish size relationship in juvenile gag (*Mycteroperca microlepis*) of the eastern Gulf of Mexico: a comparison of growth rates between laboratory and field populations. Fisheries Research 60(2-3):255-265.

Sutton, S.G., R. B. Ditton, J.R. Stoll, and J.W. Milon. 1999. A cross-sectional study and longitudinal perspective on the social and economic characteristics of the charter and party boat fishing industry of Alabama, Mississippi, Louisiana, and Texas. Report by the Human Dimensions of Recreational Fisheries Research Laboratory, Texas A&M University, MARFIN program grant number NA77FF0551.

Thompson, R. and J.L. Munro. 1974. The biology, ecology and bionomics of Caribbean reef fishes: Lutjanidae (snappers). Zoology Dep., Univ. West Indies, Kingston, Jamaica Res. Rep. 3.

USDOC (U.S. Department of Commerce). 2009. Fisheries Economics of the United States 2006. Economic and Sociocultural Status and Trend Series. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service. 158 pp.

Wenner, E.L., G.F. Ulrich, and J.B. Wise. 1987. Exploration for the golden crab, *Geryon*

fenneri, in the south Atlantic Bight: distribution, population structure, and gear assessment. Fishery Bulletin 85: 547-560.

Appendix A. Glossary

Acceptable 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 percent 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 waters 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.

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.

Head Boat: 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 Fisheries Statistics Survey (MRFSS): 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: Percent 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 advise 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 B. Essential Fish Habitat and Move to Ecosystem Based Management

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

The 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 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; maintain or improving economic, social and cultural benefits from resources; and maintaining or improving biological, economic and cultural diversity. Development of a regional FEP (SAFMC 2009b) provided an opportunity to expand 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 at 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 1998b) 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 that presents more complete and detailed information describing the South Atlantic ecosystem and the impact of the fisheries on the environment. This FEP updates information on designated Essential Fish Habitat (EFH) and EFH-Habitat Areas of Particular Concern; expands descriptions of biology and status of managed species; presents information that will support ecosystem considerations for managed species; and describes the social and economic characteristics of the fisheries in the region. In addition, it expands the discussion and description of existing research programs and needs to identify biological, social, and economic research needed to fully address ecosystem-based management in the region. In 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

The Comprehensive Amendment addressing EFH in Fishery Management Plans of the South Atlantic Region (SAFMC 1998d) specified EFH and EFH-HAPCs for all FMPs.

The Comprehensive Ecosystem-Based Amendment (CE-BA) 1 (SAFMC 2009c) is supported by the FEP and updates EFH and EFH-HAPC information and addresses the Final EFH Rule (e.g., GIS presented for all EFH and EFH-HAPCs). Management actions implemented in the CE-BA 1 establish 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.

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 2009c) 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 addresses non-regulatory updates for existing EFH and EFH- HAPC information and addresses the spatial requirements of the Final EFH Rule (i.e., GIS presented for all EFH and EFH-HAPCs).

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 the development of the FEP and CE-BA as well as coordinate with partners on other regional efforts.

These efforts include participation as a member and on the Board of 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 assessment process 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 on the Council's Habitat and Ecosystem Internet Mapping System to facilitate model and tool development
- Expanding IMS and Arc Services will provide permissioned researchers access to data or products including those collected/developed by SA OOS partners

In addition, the Council serves on the National Habitat Board and, as a member of the Southeast Aquatic Resource Partnership (SARP), has highlighted the collaboration by including the Southeast Aquatic Habitat Plan 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.

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 (SAA). This will also provide regional guidance and resources that will address State and Council broader habitat and ecosystem conservation goals. The SAA 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. Alliance 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. An Action Plan was approved by the Governors and an Implementation Plan is under development.

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.

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)

http://www.safmc.net/EcosystemManagement/EcosystemBoundaries/MappingandGISData/tabid/632/Default.aspx. 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 evolve, the distribution and use of GIS demands greater capabilities. The Council has continued its collaboration with FWRI in the new evolution to Web Services initially for Essential Fish Habitat (http://ocean.floridamarine.org/SAFMC_EFH/) and Fishery Regulations (http://ocean.floridamarine.org/SAFMC_Regulations/) and is refining permissioned services for Fishery Independent and Habitat Research and developing one for Ocean Energy activities in the region (e.g., wind, wave and current).

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 including Special Management Zones. Pursuant to the development of the Comprehensive Ecosystem-Based Amendment 1, the Council is taking 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 of 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 source document to the CE-BAs. NOAA should support and build on 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 by the guidelines to provide the Council for all FMPs implemented under the

Magnuson-Stevens Act. The FEP, serving as the source document for CE-BAs, could also meet 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 1998c) 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. In addition to the workshop process described above, 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.

South Atlantic Bight Ecopath Model

The Council worked cooperatively 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 (e.g., Biscayne Bay) only with significant investment of new resources through other programs will a comprehensive regional model be further developed.

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 is being updated (pursuant to the EFH Final Rule) in the Council's Fishery Ecosystem Plan:

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 2000 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 the Comprehensive Ecosystem-based Amendment 2 (CE-BA 2; SAFMC 2011e) established 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 (SAFMC 2007); 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

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, 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 this 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 (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) must 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 to 30 m depth, subtropical (15°-35° C), oligotrophic waters with high (30-35$^{o}/_{oo}$) salinity and turbidity levels sufficiently low enough to provide algal symbionts adequate sunlight penetration for photosynthesis. Ahermatypic stony corals are not light restricted and their 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$^{o}/_{oo}$) salinity waters in depths exceeding 18 meters (54 feet), not restricted by light penetration on the outer shelf throughout the management area.

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

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

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

Deepwater Coral HAPCs designated in the 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, 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, 1998d) (dolphin was included within the Coastal Migratory Pelagics FMP).

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).

Pelagic *Sargassum* Habitat FMP

The Council through CE-BA 2 (SAFMC 2011e) 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, 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.

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 of 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 six deepwater CHAPCs: Cape Lookout Lophelia Banks, Cape Fear Lophelia Banks, Stetson Reefs, Savannah and East Florida Lithoherms, and Miami Terrace (Stetson-Miami Terrace), Pourtales Terrace, and Blake Ridge Diapir Methane Seep.
- Within the deepwater CHAPCs, the possession of coral species and the use of all bottom damaging gear is 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 the following habitat policy statements which are available on the Habitat and Ecosystem section of the Council website.

Appendix C. Other Applicable Law

Administrative Procedures Act

All federal rulemaking is governed under the provisions of the Administrative Procedures Act (APA) (5 U.S.C. Subchapter II), which establishes a "notice and comment" procedure to enable public participation in the rulemaking process. Under the APA, NMFS is required to publish notification of proposed rules in the *Federal Register* and to solicit, consider and respond to public comment on those rules before they are finalized. The APA also establishes a 30-day wait period from the time a final rule is published until it takes effect, with some exceptions. This amendment complies with the provisions of the APA through the South Atlantic Fishery Management Council's (South Atlantic Council) extensive use of public meetings, requests for comments and consideration of comments. The proposed rule associated with this amendment will have request for public comments, which complies with the APA.

Information Quality Act

The Information Quality Act (Section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Public Law 106-443)) which took effect October 1, 2002, directed the Office of Management and Budget (OMB) to issue government-wide guidelines that "provide policy and procedural guidelines to federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information disseminated by federal agencies." OMB directed each federal agency to issue its own guidelines, establish administrative mechanisms allowing affected persons to seek and obtain correction of information that does not comply with OMB guidelines, and report periodically to OMB on the number and nature of complaints.

The NOAA Section 515 Information Quality Guidelines require a series of actions for each new information product subject to the Information Quality Act (IQA). This document has used the best available information and made a broad presentation thereof. The process of public review of this document provides an opportunity for comment and challenge to this information, as well as for the provision of additional information.

The information contained in this document was developed using best available scientific information. Therefore, Regulatory Amendment 15 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Regulatory Amendment 15) and Environmental Assessment are in compliance with the IQA.

Coastal Zone Management Act

Section 307(c)(1) of the federal Coastal Zone Management Act (CZMA) of 1972 requires that all federal activities that directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. While it is the goal of the South Atlantic Council to have management measures that complement those of the states, federal and state administrative procedures vary and

regulatory changes are unlikely to be fully instituted at the same time. Based on the analysis of the environmental consequences of the proposed actions in **Section 4.0**, the South Atlantic Council has concluded this amendment would improve federal management of the yellowtail snapper and gag grouper portions of the snapper grouper fishery and is consistent to the maximum extent practicable with the Coastal Zone Management Plans of Florida, Georgia, South Carolina, and North Carolina. This determination will be submitted to the responsible state agencies under Section 307 of the CZMA administering approved Coastal Zone Management Programs in the States of Florida, South Carolina, Georgia, and North Carolina.

Endangered Species Act

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

NMFS completed a biological opinion (NMFS 2006) in 2006 evaluating the impacts of the continued authorization of the South Atlantic snapper grouper fishery under the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP) and Amendment 13C (SAFMC 2006) to the Snapper Grouper FMP on ESA-listed species (see **Section 3.0**). The opinion stated the fishery was not likely to adversely affect North Atlantic right whale critical habitat or marine mammals (see NMFS 2006 for discussion on these species). However, the opinion did state that the snapper grouper fishery would adversely affect sea turtles and smalltooth sawfish, but would not jeopardize their continued existence. An incidental take statement was issued for green, hawksbill, Kemp's ridley, leatherback, and loggerhead sea turtles, as well as smalltooth sawfish. Reasonable and prudent measures to minimize the impact of these incidental takes were specified, along with terms and conditions to implement them. The anticipated number of sea turtle takes over consecutive 3-year periods is shown in **Table C-1**.

Table C-1. Three-year South Atlantic anticipated takes of sea turtles in the snapper grouper fishery.

Species	Amount of Take	Total
Green	Total Take	39
	Lethal Take	14
Hawksbill	Total Take	4
	Lethal Take	3
Kemp's Ridley	Total Take	19
	Lethal Take	8
Leatherback	Total Take	25
	Lethal Take	15
Loggerhead	Total Take	202
	Lethal Take	67

Source: NMFS 2006.

Regulations implemented through snapper-grouper Amendment 15B (SAFMC 2008b) (74 FR 31225; June 30, 2009) and updated in Comprehensive Ecosystem-Amendment 2 (SAFMC 2011e) (76 FR 82183; December 30, 2011) 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 and smalltooth sawfish. These regulations are thought to decrease the mortality associated with accidental interactions with sea turtles and smalltooth sawfish.

Subsequent to the June 7, 2006, biological opinion, elkhorn and staghorn coral (*Acropora cervicornis* and *Acropora palmata*) were listed as threatened. In a consultation memorandum dated July 9, 2007, NMFS concluded the continued authorization of the South Atlantic snapper-grouper fishery is not likely to adversely affect these *Acropora* species. On November 26, 2008, an *Acropora* critical habitat was designated. In a consultation memorandum dated December 2, 2008, NMFS concluded the continued authorization of the snapper-grouper fishery is not likely to adversely affect *Acropora* critical habitat.

Additionally, on September 22, 2011, NMFS and the U.S. Fish and Wildlife Service determined the loggerhead sea turtle population consists of nine distinct population segments (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 (NWA) DPS, which remains listed as threatened.

Five DPSs of Atlantic sturgeon were also listed since the completion of the 2006 biological opinion. In a consultation memorandum dated February 15, 2012, NMFS concluded the continued authorization of the South Atlantic snapper-grouper fishery is not likely to adversely affect the Atlantic sturgeon. The February 15, 2012, memorandum also stated that because the 2006 biological opinion had evaluated the impacts of the fishery on the loggerhead subpopulations now wholly contained within the

NWA DPS, the opinion's conclusion that the fishery is not likely to jeopardize the continued existence of loggerhead sea turtles remains valid.

Executive Order 12612: Federalism

E.O. 12612 requires agencies to be guided by the fundamental federalism principles when formulating and implementing policies that have federalism implications. The purpose of the Order is to guarantee the division of governmental responsibilities between the Federal government and the States, as intended by the framers of the Constitution. No federalism issues have been identified relative to the actions proposed in this amendment and associated regulations. Therefore, preparation of a Federalism assessment under E.O. 13132 is not necessary.

Executive Order 12866: Regulatory Planning and Review

E.O. 12866, signed in 1993, requires federal agencies to assess the costs and benefits of their proposed regulations, including distributional impacts, and to select alternatives that maximize net benefits to society. To comply with E.O. 12866, NMFS prepares a Regulatory Impact Review (RIR) for all fishery regulatory actions that implement a new FMP or that significantly amend an existing plan (**Appendix H**). RIRs provide a comprehensive analysis of the costs and benefits to society associated with proposed regulatory actions, the problems and policy objectives prompting the regulatory proposals, and the major alternatives that could be used to solve the problems. The reviews also serve as the basis for the agency's determinations as to whether proposed regulations are a "significant regulatory action" under the criteria provided in E.O. 12866 and whether proposed regulations will have a significant economic impact on a substantial number of small entities in compliance with the RFA. A regulation is significant if it is likely to result in an annual effect on the economy of at least $100,000,000 or if it has other major economic effects.

In accordance with E.O. 12866, the following is set forth by the South Atlantic Council: (1) this rule is not likely to have an annual effect on the economy of more than $100 million or to adversely affect in a material way the economy, a sector of the economy, productivity, jobs, the environment, public health or safety, or state, local, or tribal governments or communities; (2) this rule is not likely to create any serious inconsistencies or otherwise interfere with any action take or planned by another agency; (3) this rule is not likely to materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights or obligations of recipients thereof; (4) this rule is not likely to raise novel or policy issues arising out of legal mandates, or the principles set forth in the Executive Order; and (5) this rule is not controversial.

Executive Order 12962: Recreational Fisheries

E.O. 12962 requires Federal agencies, in cooperation with States and Tribes, to improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities through a variety of methods

including, but not limited to, developing joint partnerships; promoting the restoration of recreational fishing areas that are limited by water quality and habitat degradation; fostering sound aquatic conservation and restoration endeavors; and evaluating the effects of federally-funded, permitted, or authorized actions on aquatic systems and evaluating the effects of federally-funded, permitted, or authorized actions on aquatic systems and recreational fisheries, and documenting those effects. Additionally, the order establishes a seven member National Recreational Fisheries Coordination Council responsible for, among other things, ensuring that social and economic values of healthy aquatic systems that support recreational fisheries are considered by Federal agencies in the course of their actions, sharing the latest resource information and management technologies, and reducing duplicative and cost-inefficient programs among federal agencies involved in conserving or managing recreational fisheries. The South Atlantic Council also is responsible for developing, in cooperation with Federal agencies, States and Tribes, a Recreational Fishery Resource Conservation Plan - to include a five-year agenda. Finally, the Order requires NOAA Fisheries Service and the U.S. Fish and Wildlife Service to develop a joint agency policy for administering the ESA.

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

Executive Order 13089: Coral Reef Protection

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

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

Executive Order 13158: Marine Protected Areas

E.O. 13158 was signed on May 26, 2000, to strengthen the protection of U.S. ocean and coastal resources through the use of Marine Protected Areas (MPAs). The E.O. defined MPAs as "any area of the marine environment that has been reserved by Federal, State, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein." It directs federal agencies to work closely with state, local and non-governmental partners to create a comprehensive network of MPAs "representing diverse U.S. marine ecosystems, and the Nation's natural and cultural resources".

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

Marine Mammal Protection Act

The Marine Mammal Protection Act (MMPA) established a moratorium, with certain exceptions, on the taking of marine mammals in U.S. waters and by U.S. citizens on the high seas. It also prohibits the importing of marine mammals and marine mammal products into the United States. Under the MMPA, the Secretary of Commerce (authority delegated to NOAA Fisheries Service) is responsible for the conservation and management of cetaceans and pinnipeds (other than walruses). The Secretary of the Interior is responsible for walruses, sea otters, polar bears, manatees, and dugongs.

Part of the responsibility that NOAA Fisheries Service has under the MMPA involves monitoring populations of marine mammals to make sure that they stay at optimum levels. If a population falls below its optimum level, it is designated as "depleted." A conservation plan is then developed to guide research and management actions to restore the population to healthy levels.

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

Under the MMPA, to legally fish in a Category I and/or II fishery, a fisherman must take certain steps. For example, owners of vessels or gear engaging in a Category I or II fishery, are required to obtain a marine mammal authorization by registering with the Marine Mammal Authorization Program (50 CFR 229.4). They are also required to accommodate an observer if requested (50 CFR 229.7(c)) and they must comply with any applicable take reduction plans.

The commercial hook-and-line components of the South Atlantic snapper grouper fishery (i.e., bottom longline, bandit gear, and handline) are listed as part of a Category III fishery under the 2012 List of Fisheries (76 FR 73912; November 29, 2011) because there have been no documented interactions between these gear and marine mammals.

Migratory Bird Treaty Act and Executive Order 13186

The Migratory Bird Treaty Act (MBTA) implemented several bilateral treaties for bird conservation between the United States and Great Britain, the United States and

Mexico, the United States and Japan, and the United States and the former Union of Soviet Socialists Republics. Under the MBTA, it is unlawful to pursue, hunt, take, capture, kill, possess, trade, or transport any migratory bird, or any part, nest, or egg of a migratory bird, included in treaties between the, except as permitted by regulations issued by the Department of the Interior (16 U.S.C. 703-712). Violations of the MBTA carry criminal penalties. Any equipment and means of transportation used in activities in violation of the MBTA may be seized by the United States government and, upon conviction, must be forfeited to it.

Executive Order 13186 directs each federal agency taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations to develop and implement a memorandum of understanding (MOU) with the U.S. Fish and Wildlife Service (USFWS) to conserve those bird populations. In the instance of unintentional take of migratory birds, NOAA Fisheries Service would develop and use principles, standards, and practices that will lessen the amount of unintentional take in cooperation with the USFWS. Additionally, the MOU would ensure that NEPA analyses evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern.

An MOU was signed on August 15, 2012, which will address the incidental take of migratory birds in commercial fisheries under the jurisdiction of NOAA Fisheries Service. NOAA Fisheries Service must monitor, report, and take steps to reduce the incidental take of seabirds that occurs in fishing operations. The United States has already developed the U.S. National Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries. Under that plan many potential MOU components are already being implemented.

The alternatives considered in this amendment are consistent with the directives of E.O. 13186.

National Environmental Policy Act

Regulatory Amendment 15 has been written and organized in a manner that meets National Environmental Policy Act (NEPA) requirements, and thus is a consolidated NEPA document, including a draft Environmental Assessment as described in NOAA Administrative Order (NAO) 216-6, Section 6.03.a.2.

Purpose and Need for Action

The purpose and need for this action are described in **Section 1.4.**

Alternatives

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

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

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

Paperwork Reduction Act

The purpose of the Paperwork Reduction Act (PRA) is to minimize the burden on the public. The PRA is intended to ensure that the information collected under the proposed action is needed and is collected in an efficient manner (44 U.S.C. 3501 (1)). The authority to manage information collection and record keeping requirements is vested with the Director of the Office of OMB. This authority encompasses establishment of guidelines and policies, approval of information collection requests, and reduction of paperwork burdens and duplications. PRA requires NOAA Fisheries Service to obtain approval from the OMB before requesting most types of fishery information from the public. No data collection programs are included in Regulatory Amendment 15.

Regulatory Flexibility Act

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

Small Business Act

Enacted in 1953, the Small Business Act requires that agencies assist and protect small-business interests to the extent possible to preserve free competitive enterprise. The objectives of the act are to foster business ownership by individuals who are both socially and economically disadvantaged; and to promote the competitive viability of

such firms by providing business development assistance including, but not limited to, management and technical assistance, access to capital and other forms of financial assistance, business training, and counseling, and access to sole source and limited competition federal contract opportunities, to help firms achieve competitive viability. Because most businesses associated with fishing are considered small businesses, NOAA Fisheries Service, in implementing regulations, must make an assessment of how those regulations will affect small businesses.

Public Law 99-659: Vessel Safety

Public Law 99-659 amended the Magnuson-Stevens Fishery Conservation and Management Act to require that a fishery management plan (FMP) or FMP amendment must consider, and may provide for, temporary adjustments (after consultation with the U.S. Coast Guard and persons utilizing the fishery) regarding access to a fishery for vessels that would be otherwise prevented from participating in the fishery because of safety concerns related to weather or to other ocean conditions.

No vessel would be forced to participate in South Atlantic fisheries under adverse weather or ocean conditions as a result of the imposition of management regulations proposed in this amendment.

No concerns have been raised by South Atlantic fishermen or by the U.S. Coast Guard that the proposed management measures directly or indirectly pose a hazard to crew or vessel safety under adverse weather or ocean conditions. Therefore, this amendment proposes neither procedures for making management adjustments due to vessel safety problems nor procedures to monitor, evaluate, or report on the effects of management measures on vessel or crew safety under adverse weather or ocean conditions.

Appendix D. History of Management

History of Management of the South Atlantic Snapper Grouper Fishery

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 FMP, as well as some events not covered in amendment actions.

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" 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 lbs s-g on board. -Established rebuttable assumption that vessel with s-g on board had harvested such fish in 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.
Notice of Control Date	09/24/90	55 FR 39039	-Anyone entering federal wreckfish fishery in the EEZ off S. Atlantic states after 09/24/90 was not assured of future access if limited entry program developed.
Regulatory Amendment #3 (1989)	11/02/90	PR: 55 FR 28066 FR: 55 FR 40394	-Established artificial reef at Key Biscayne, FL as SMZ. Fish trapping, bottom longlining, spear fishing, and harvesting of Goliath grouper prohibited in SMZ.
Amendment #2 (1990)	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

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.
Emergency Rule	8/3/90	55 FR 32257	-Added wreckfish to the 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
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 and overfishing -Required permit to fish for, land or sell wreckfish; -Required catch and effort reports from selected, permitted vessels; -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; and -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.

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 #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" limit – lane snapper -10" limit – vermilion snapper (recreational only) -12" limit – red porgy, vermilion snapper (commercial only), gray, yellowtail, mutton, schoolmaster, queen, blackfin, cubera, dog, mahogany, and silk snappers -20" limit – red snapper, gag, and red, black, scamp, yellowfin, and yellowmouth groupers. -28" 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 south of Cape Canaveral, FL -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	-Wreckfish: established limited entry system with 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 TAC

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.
Emergency Rule	8/31/92	57 FR 39365	-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	-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	-Black Sea Bass: modified definition of bsb pot; allowed multi-gear trips for bsb; allowed retention of incidentally-caught fish on bsb trips
Regulatory Amendment #5 (1992c)	07/31/93	PR: 58 FR 13732 FR: 58 FR 35895	-Established 8 SMZs off S. 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 Total Allowable Catch (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 IFQ 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 N. Carolina -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 bsb pot fishery off S. Atlantic states after 04/23/97 was not assured of future access if limited entry program developed.

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 #8 (1997a)	12/14/98	PR: 63 FR 1813 FR: 63 FR 38298	-Established program to limit initial eligibility for snapper grouper fishery: Must demonstrate landings of any species in SG FMU in 1993, 1994, 1995 or 1996; and have held valid SG permit between 02/11/96 and 02/11/97. -Granted transferable permit with unlimited landings if vessel landed ≥ 1,000 lbs. of snapper grouper spp. 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 Council's habitat responsibility -Allowed retention of snapper grouper spp. 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.
Regulatory Amendment #7 (1998)	01/29/99	PR: 63 FR 43656 FR: 63 FR 71793	-Established 10 SMZs at artificial reefs off South Carolina.
Interim Rule Request	1/16/98		-Council requested all Amendment 9 measures except black sea bass pot construction changes be implemented as an interim request under MSA
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
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

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 #9 (1998b)	2/24/99	PR: 63 FR 63276 FR: 64 FR 3624	-Red porgy: 14" length (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" length (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 lbs; 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" length (recreational), 12" length commercial -Gag: 24" length (recreational); no commercial harvest or possession > bag limit, and no purchase or sale, during March and April. -Black grouper: 24" length (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 SG without a bag limit: aggregate recreational bag limit 20 fish/person/day, excluding tomtate and blue runners -Vessels with longline gear aboard may only possess snowy, warsaw, yellowedge, and misty grouper, and golden, blueline and sand tilefish.
Amendment #9 (1998b) resubmitted	10/13/00	PR: 63 FR 63276 FR: 65 FR 55203	-Commercial trip limit for greater amberjack
Regulatory Amendment #8 (2000a)	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
Emergency Interim Rule	09/08/99, expired 08/28/00	64 FR 48324 and 65 FR 10040	-Prohibited harvest or possession of red porgy.
Emergency Action	9/3/99	64 FR 48326	-Reopened the Amendment 8 permit application process
Amendment #10 (1998d)	07/14/00	PR: 64 FR 37082 and 64 FR 59152 FR: 65 FR 37292	-Identified EFH and established HAPCs for species in the SG FMU.

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 #11 (1998e)	12/02/99	PR: 64 FR 27952 FR: 64 FR 59126	-MSY proxy: goliath and Nassau grouper = 40% static 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 (MSST=3.72 mp, 1995 biomass=1.33 mp); undergoing overfishing (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 (2000c)	09/22/00	PR: 65 FR 35877 FR: 65 FR 51248	-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 comm. trip limit May-December; modified management options and list of possible framework actions.
Amendment #13A (2003b)	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 spp. within the *Oculina* Experimental Closed Area.
Notice of Control Date	10/14/05	70 FR 60058	-The Council is considering 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 (gutted weight) = 151,000 lbs gw in year 1, 118,000 lbs gw in year 2, and 84,000 lbs gw in year 3 onwards. Trip limit = 275 lbs gw in year 1, 175 lbs gw in year 2, and 100 lbs gw in year 3 onwards. Recreational: Limit possession to one snowy grouper in 5 grouper per person/day aggregate bag limit.

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.
			2. Golden Tilefish Commercial: Quota of 295,000 lbs gw, 4,000 lbs gw trip limit until 75% of the quota is taken when the trip limit is reduced to 300 lbs gw. Do not adjust the trip limit downwards unless 75% is captured on or before September 1. Recreational: Limit possession to 1 golden tilefish in 5 grouper per person/day aggregate bag limit. 3. Vermilion Snapper Commercial: Quota of 1,100,000 lbs gw. Recreational: 12" size limit. 4. Black Sea Bass Commercial: Commercial quota (gutted weight) of 477,000 lbs gw in year 1, 423,000 lbs gw in year 2, and 309,000 lbs gw in year 3 onwards. Require 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. Require black sea bass pots be removed from the water when the quota is met. Change fishing year from calendar year to June 1 – May 31. Recreational: Recreational allocation of 633,000 lbs gw in year 1, 560,000 lbs gw in year 2, and 409,000 lbs gw in year 3 onwards. Increase minimum size limit from 10" to 11" in year 1 and to 12" in year 2. Reduce recreational bag limit from 20 to 15 per person per day. Change fishing year from the calendar year to June 1 through May 31. 5. Red Porgy Commercial and recreational: 1. Retain 14" TL size limit and seasonal closure (retention limited to the bag limit); 2. Specify a commercial quota of 127,000 lbs 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; 3. Increase commercial trip limit from 50 lbs ww to 120 red porgy (210 lbs gw) during May through December; 4. Increase recreational bag limit from one to three red porgy per person per day.
Notice of Control Date	3/8/07	72 FR 60794	-The Council may consider measures to limit participation in the snapper grouper for-hire fishery
Amendment #14 (2007)	2/12/09	PR: 73 FR 32281 FR: 74 FR 1621	-Establish 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	- Establish rebuilding plans and SFA parameters for snowy grouper, black sea bass, and red porgy.
Amendment #15B (2008b)	2/15/10	PR: 74 FR 30569 FR: 74 FR 58902	-Prohibit the sale of bag-limit caught snapper grouper species. -Reduce the effects of incidental hooking on sea turtles and smalltooth sawfish. -Adjust commercial renewal periods and transferability requirements. -Implement plan to monitor and assess bycatch, -Establish reference points for golden tilefish. -Establish allocations for snowy grouper (95% com & 5%

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.
			rec) and red porgy (50% com & 50% rec).
Amendment #16 (SAFMC 2009a)	7/29/09	PR: 74 FR 6297 FR: 74 FR 30964	-Specify SFA parameters for gag and vermilion snapper -For gag grouper: Specify interim allocations 51%com & 49%rec; rec & com spawning closure January through April; directed com quota=348,440 pounds gutted weight; -reduce 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 species within the 3-fish grouper aggregate. -For vermilion snapper: Specify interim allocations 68%com & 32%rec; directed com quota split Jan-June=168,501 pounds gutted weight and 155,501 pounds July-Dec; reduce bag limit from 10 to 4 and a rec closed season October through May 15. In addition, the NMFS RA will set new regulations based on new stock assessment. -Require dehooking tools.
Amendment #17A (SAFMC 2010a)	12/3/10 red snapper closure; circle hooks March 3, 2011	PR: 75 FR 49447 FR: 75 FR 76874	- Required use of non-stainless steel circle hooks when fishing for snapper grouper species with hook-and-line gear north of 28 deg. N latitude in the South Atlantic EEZ -Specify an ACL and an AM for red snapper with management measures to reduce the probability that catches will exceed the stocks' ACL -Specify a rebuilding plan for red snapper -Specify status determination criteria for red snapper -Specify a monitoring program for red snapper
Emergency Rule	12/3/10	75 FR 76890	- Delay the effective date of the area closure for snapper grouper species implemented through Amendment 17A
Amendment #17B (SAFMC 2010b)	January 31, 2011	PR: 75 FR 62488 FR: 75 FR 82280	-Specify ACLs, ACTs, and AMs, where necessary, for 9 species undergoing overfishing. -Modify management measures as needed to limit harvest to the ACL or ACT. -Update the framework procedure for specification of total allowable catch. -Prohibited harvest of deepwater species seaward of 240 feet to curb bycatch of speckled hind and warsaw grouper
Notice of Control Date	12/4/08	74 FR 7849	Establishes a control date for the golden tilefish fishery of the South Atlantic
Notice of Control Date	12/4/08	74 FR 7849	- Establishes control date for black sea bass pot fishery of the South Atlantic
Amendment #19 (Comprehensive Ecosystem-based Amendment 1; SAFMC 2009c)	7/22/10	PR: 75 FR 14548 FR: 75 FR 35330	-Provide presentation of spatial information for Essential Fish Habitat (EFH) and EFH-Habitat Areas of Particular Concern (EFH-HAPC) designations under the Snapper Grouper FMP - Designation of deepwater coral HAPCs
Regulatory Amendment #10 (SAFMC 2010c)	5/31/11	PR: 76 FR 9530 FR: 76 FR 23728	-Eliminate closed area for snapper grouper species approved in Amendment 17A

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 #9 (SAFMC 2011a)	Bag limit: 6/22/11 Trip limits: 7/15/11	PR: 76 FR 23930 FR: 76 FR 34892	- Establish trip limit for vermilion snapper and gag, increase trip limit for greater amberjack, and reduce bag limit for black sea bass
Regulatory Amendment #11 (2011b)	5/10/12	PR: 76 FR 78879 FR: 77 FR 27374	- Eliminate 240 ft closure for six deepwater species.
Amendment # 25 (Comprehensive ACL Amendment) (SAFMC 2011c)	4/16/12	PR: 76 FR 74757 Amended PR: 76 FR 82264 FR: 77 FR 15916	-Establish ABC control rules, establish ABCs, ACLs, and AMs for species not undergoing overfishing -Remove some species from South Atlantic FMU and designate others as Ecosystem Component Species -Specify allocations between the commercial and, recreational sectors for species not undergoing overfishing -Limit the total mortality for federally managed species in the South Atlantic to the ACLs
Amendment #24 (SAFMC 2011d)	7/11/12	PR: 77 FR 19169 FR: 77 FR 34254	-Specify MSY, rebuilding plan (including ACLs, AMs, and OY), and allocations for red grouper
Amendment #23 (Comprehensive Ecosystem-based Amendment 2; SAFMC 2011e)	1/30/12	PR: 76 FR 69230 FR: 76 FR 82183	- Designate the Deepwater MPAs as EFH-HAPCs - Limit harvest of snapper grouper species in SC Special Management Zones to the bag limit - Modify sea turtle release gear
Amendment #20B	TBD	TBD	-Update wreckfish ITQ according to reauthorized Magnuson-Stevens Act
Amendment #18A (SAFMC 2012a)	7/1/12	PR: 77 FR 16991 FR: 77FR3 2408	- Limit participation and effort in the black sea bass fishery - Modifications to management of the black sea bass pot fishery - Improve the accuracy, timing, and quantity of fisheries statistics
Amendment #20A (SAFMC 2012b)	10/26/12	PR: 77 FR 19165 FR: 77 FR 59129	-Redistribute latent shares for the wreckfish ITQ program.
Regulatory Amendment #12 (SAFMC 2012c)	10/9/12	FR: 77 FR 61295	-Adjust the Annual Catch Limit (ACL) and Optimum Yield (OY) for golden tilefish -Consider specifying a commercial Annual Catch Target (ACT) -Revise recreational Accountability Measures (AMs) for golden tilefish.

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 #18B	TBD	TBD	-Limit participation and effort in the golden tilefish fishery through establishment of a longline endorsement -Change the golden tilefish fishing year -Modify trip limits -specify allocations for gear groups (longline and hook and line)
Amendment # 26 (Comprehensive Ecosystem-Based Amendment 3)	TBD	TBD	-Modify bycatch and discard reporting for commercial and for-hire vessels
Regulatory Amendment 13	TBD	TBD	-Revise the ABCs, ACLs (including sector ACLs), and ACTs implemented by the Comprehensive ACL Amendment (SAFMC 2011c). The revisions may prevent a disjunction between the established ACLs and the landings used to determine if AMs are triggered.
Regulatory Amendment 14	TBD	TBD	-Revise the ACL (including sector ACLs), OY, and ACT for black sea bass; -Modify the fishing year and reduce of the trip limit for greater amberjack; -Provide protective measures during the spawning season for mutton snapper; -Change the measurement method for gray triggerfish; -Increase the minimum size limit for hogfish; -Modify the fishing year for both sectors for black sea bass; -Change the recreational bag limit for vermilion snapper; -Modify the aggregate grouper bag limit; and -Revise the AMs for gag, vermilion snapper, and red porgy.
Reg 15	TBD	TBD	-Modify the existing specification of optimum yield and annual catch limit for yellowtail snapper in the South Atlantic; -Modify existing regulations for yellowtail snapper in the South Atlantic; and -Modify the existing gag commercial annual catch limit and/or accountability measure for gag that requires a closure of all other shallow water groupers (black grouper, red grouper, scamp, red hind, rock hind, graysby, coney, yellowmouth grouper, and yellowfin grouper) in the South Atlantic when the gag commercial annual catch limit is met or projected to be met.
Reg 16	TBD	TBD	-Address existing derby conditions and lengthen the fishing season for the commercial longline sector of the golden tilefish portion of the snapper grouper fishery.

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.
Am 27	TBD	TBD	-Establish the South Atlantic Council as the responsible entity for managing Nassau grouper throughout its range including federal waters of the Gulf of Mexico; -Modify the crew member limit on dual-permitted snapper grouper vessels; -Modify the restriction on retention of bag limit quantities of some snapper grouper species by captain and crew of for-hire vessels; -Minimize regulatory delay when adjustments to snapper grouper species' ABC, ACLs, and ACTs are needed as a result of new stock assessments; -Address harvest of blue runner by commercial fishermen who do not possess a South Atlantic Snapper Grouper Permit.
Am 28	TBD	TBD	-Establish regulations to allow harvest of red snapper in the South Atlantic.
Am 30	TBD	TBD	-Consider requiring Vessel Monitoring Systems (VMS) for commercial snapper grouper vessels in the South Atlantic

Appendix E. South Atlantic Gag Dead Discard Analysis for Regulatory Amendment 15

NOAA Fisheries Service
Southeast Regional Office
St. Petersburg, FL
November 15, 2012

On October 23, 2012, NOAA Fisheries Service's Southeast Regional Office (SERO) provided South Atlantic Council staff with an analysis of post-quota closure commercial gag discards. This analysis is an update of the previous analysis and contains more up to date logbook landings data. Additionally, improvements were made to the methodology to better estimate post-quota discards.

A new logbook dataset was provided to SERO on October 26, 2012. In the previous analysis, logbook records submitted through February 15, 2012 were used. The number of trips reported from October 20 to December 31, 2011, increased from 479 in the February dataset to 523 in the October dataset.

The other major change to the methodology was the exclusion of discards associated with trips using spear gear, as gag would not be discarded on these trips after the quota closure. In 2011, there were 18,936 pounds gutted weight (n=73 trips) of gag caught with spear gear from October 21 to December 31, 2011. These landings were removed since spear fishermen can avoid targeting gag when the fishery is closed.

Similar to the previous analysis, scenarios were explored to estimate pounds of gag lost from discard mortality after the October 20 closure. Scenario 1 assumed all trips, including gag target trips, would continue to occur and all previously landed gag would be discarded with a 40% discard mortality rate. Table 1 summarizes the amount of gag pounds lost to discard mortality under Scenario 1.

Table 1. Scenario 1 South Atlantic gag landings and estimated dead discards from all reported trips during October 21 to December 31, 2011. All pounds are in gutted weight.

Year	Trips*	Pounds	Pounds of Gag lost to Discard Mortality
2011	450	108,160	43,264

*73 trips catching 18,935 pounds gutted weight of gag using spear were removed.

Scenario 2 eliminated gag target trips and applied a 40% discard mortality rate to the remaining pounds of gag caught on 'non-target' trips. Gag target trips were defined as a percentage of South Atlantic shallow-water grouper (SASWG) landings that came from gag on a trip. Percentages ranged from 25 to 90 percent of SASWG landings coming from gag on a trip. Table 2 summarizes the amount of gag pounds lost to discard mortality under Scenario 2.

Table 2. Scenario 2 South Atlantic gag landings and estimated dead discards in 2011 from October 21 to December 31 with gag target trips removed. Gag target trips were defined as trips where >90%, >75%, >50%, and >25% of the shallow water grouper landings came from gag. All pounds are in gutted weight.

Gag Target Trip Criteria	Trips Excluded*	Non-Target Trips Taken*	Pounds of Gag caught from Non-Target Trips Taken	Pounds of Gag Lost to Discard Mortality
>90%	247	203	58,647	23,459
>75%	290	160	38,785	15,514
>50%	371	79	9,746	3,899
>25%	418	32	1,900	760

*73 trips catching 18,936 pounds gutted weight of gag using spear were removed.

Scenario 3 is the final scenario considered and determined the pounds of gag lost from discard mortality if eliminated target trips still occurred but instead of targeting gag they fished for the other shallow water grouper. This required the average pounds of gag caught per trip to be calculated for non-target gag trips. The pounds of gag per trip displayed a lognormal distribution (Figure 1). Therefore the geometric average was calculated instead of the commonly used arithmetic average because the geometric average is a better measure of central tendency with log-normally distributed data. The geometric average of the pounds of gag per trip was multiplied against the number of gag target trips to provide the pounds of gag that could be landed if gag target trips switched to fishing for other SASWG. The discard mortality rate of 40% was applied to the pounds of gag caught to estimate dead discards in pounds. Additionally, during development of Amendment 16 to the Snapper-Grouper Fishery Management Plan the reef fish advisory panel and other fishermen reported that their trips would be reduced by 20% after a gag quota closure as fishermen would shift to targeting other SASWG. To get an additional estimate of dead discards for Scenario 3, target trips were decreased by 20% to estimate pounds of gag lost to discard mortality. Total dead discards in pounds were calculated by combining the pounds of gag lost to discard mortality from non-target trips (Scenario 2) with the pounds of gag lost to discard mortality from target trips switching to target other shallow water grouper (Scenario 3). Table 3 provides a summary of the calculations.

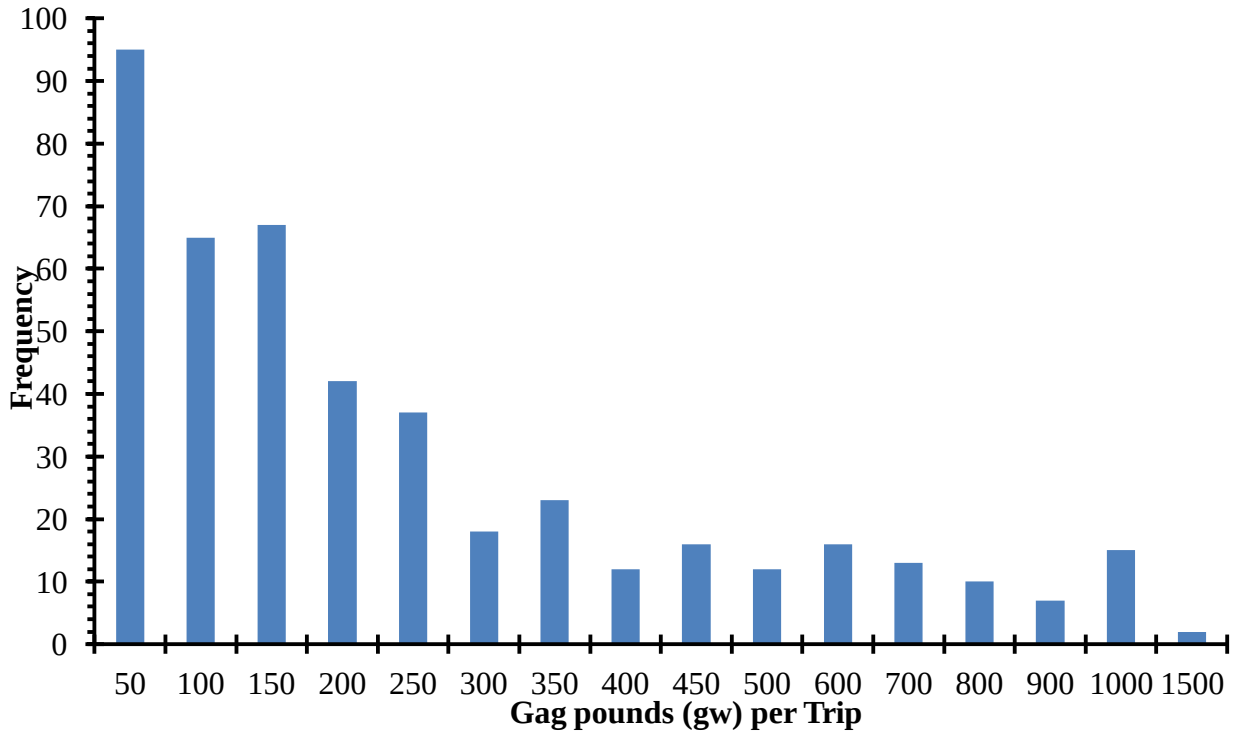

Figure 1. South Atlantic pounds of gag for each trip from October 21 to December 31, 2011 (n=450 trips). Landings by spear were removed.

Table 3. Scenario 3 South Atlantic gag landings and estimated dead discards from October 21 to December 31, 2011, with gag target trips removed. Gag target trips were defined as trips where >90%, >75%, >50%, and >25% of the shallow water grouper landings came from gag. All pounds are in gutted weight.

Gag Target Trip Criteria	Trips Switching to Targeting SASWG*	Non-Target Trips Taken*	Geometric Mean of Gag pounds per trip		Pounds of Gag Caught from Switching Gag Target trips to the other SASWG	Pounds of Gag caught from Non-Target Gag Trips	Total Pounds of Gag Lost to Discard Mortality
			Trips Switching to SASWG	Non-Target Trips Taken			
>90%	247	203	123.8	153.3	37,857	58,647	38,601
>75%	290	160	142.8	126.1	36,575	38,785	30,144
>50%	371	79	159.1	67.3	24,979	9,746	13,890
>25%	418	32	150.3	38.2	15,968	1,900	7,147
Reduction of target trips by 20% following recommendation from Amendment 16							
>90%	198	203	123.8	153.3	30,286	58,647	35,573
>75%	232	160	142.8	126.1	29,260	38,785	27,218
>50%	297	79	159.1	67.3	19,983	9,746	11,892
>25%	334	32	150.3	38.2	12,774	1,900	5,870

*73 trips catching 18,936 pounds gutted weight of gag using spear were removed.

The pounds of gag lost to discard mortality from all three scenarios were combined in Table 4. This allows a side-by-side comparison of the pounds of gag lost to discard mortality for each scenario.

Table 4. Estimates of gag dead discards from October 21 to December 31 for Scenarios 1-3. An additional calculation was done for Scenario 3 following an Amendment 16 recommendation to reduce trips taken after a gag quota closure by 20%.

Scenario 1	Gag Target Trip Criteria	Scenario 2	Scenario 3	Scenario 3 with 20% reduction
43,264	>90%	23,459	38,601	35,573
	>75%	15,514	30,144	27,218
	>50%	3,899	13,890	11,892
	>25%	760	7,147	5,870

Discussion

The commercial gag quota was met on October 20, 2012. It's unknown when the gag quota will be met in future years as landings are contingent on stock abundance, fishing effort, and other factors. Since future closure dates are unknown, this analysis focused on estimating how many gag would be discarded dead if gag closes on October 20 each year, but other SASWG and non-SASWG species remain open to harvest.

The criteria used to define gag target trip significantly impacts the pounds of gag lost to discard mortality. Table 3 summarizes the difference between geometric mean trip catches on target and non-target trips. Under the >90% and >75% target trip criterion, geometric mean catches per trip were relatively similar between 'target' and 'non-target' trips. Using a >50 criterion for defining 'target' trips results in target trips having a geometric mean catch rate 2.4X greater than non-target trips. This seems to be the most appropriate criterion for defining target trips given that catch rates would be expected to be different from trips directed at gag versus trips not directed toward gag.

As with any analysis, results are contingent on analytical assumptions. The analysis uses historical logbook landings data, which is assumed to be representative of future fishing conditions. If catch rates are higher or lower than previously reported, estimates of dead discards may be over or underestimated. Additionally, changes in management and implement of quota closures can affect species caught with one another. Quota and seasonal closure for non-SASWG species could result in 'target' gag trips being overestimated since gag would represent a greater portion of the catch when other non-SASWG species are closed. This analysis also assumes gag 'target' trips will either be eliminated or occur, but some trips that previously targeted gag may still occur, resulting in dead discard estimates.

Appendix F. Gag and other shallow-water grouper landings off North Carolina, 2008-2012.

Gag were the third most commonly landed species on red grouper trips from 2008 to 2011. Red grouper off North Carolina were most commonly landed with vermilion snapper and gray triggerfish.

Table F-1. Top species landed on red grouper "target" trips from 2008 through 2011 off North Carolina. Red grouper "target" trip = trip landing >200 pounds red grouper. Landings in pounds whole weight.

SPECIES	2008	2009	2010	2011	2012[1]	Average Landings
Red Grouper	388,119	232,617	189,994	117,600	71,332	199,932
Vermilion Snapper	229,624	106,926	38,196	40,876	19,961	87,117
Triggerfish	96,883	99,349	60,431	43,191	18,991	63,769
Gag	43,652	30,621	52,182	36,578	26,003	37,807
Red Porgy	47,391	41,281	35,508	30,267	19,822	34,854
Scamp	45,161	35,977	35,031	17,740	19,590	30,700
Grunts	38,099	19,649	13,267	8,473	8,791	17,656
Amberjacks	25,449	14,694	14,344	5,130	5,793	13,082
Almaco Jack	9,067	9,876	12,569	5,003	16,521	10,607
Dolphin	9,457	18,024	8,442	5,940	4,619	9,296
Red Hind	9,975	8,463	5,537	2,649	2,532	5,831

Source: North Carolina Marine Fisheries Division, 2012.
[1] Data for 2012 are preliminary and include only January through August.

Note that commercial harvest of gag was open during the period covered by these analyses. Therefore, fishermen may have a greater ability to avoid gag than is shown. If fishermen were not actively avoiding gag during this time, then it could be expected that they would be more successful at avoiding it if that was indeed their intent.

The analyses above indicate that trips do occur that catch many more red grouper than gag, and vice versa. Also, the percentage of gag occurring on target red grouper trips is increasing.

The percent composition of several shallow-water grouper species, including gag, on trips targeting gag off North Carolina from 2008 to 2011 is shown in **Figure F-1**. Gag trips are consistently 70-80% gag, and there is no noticeable trend over time.

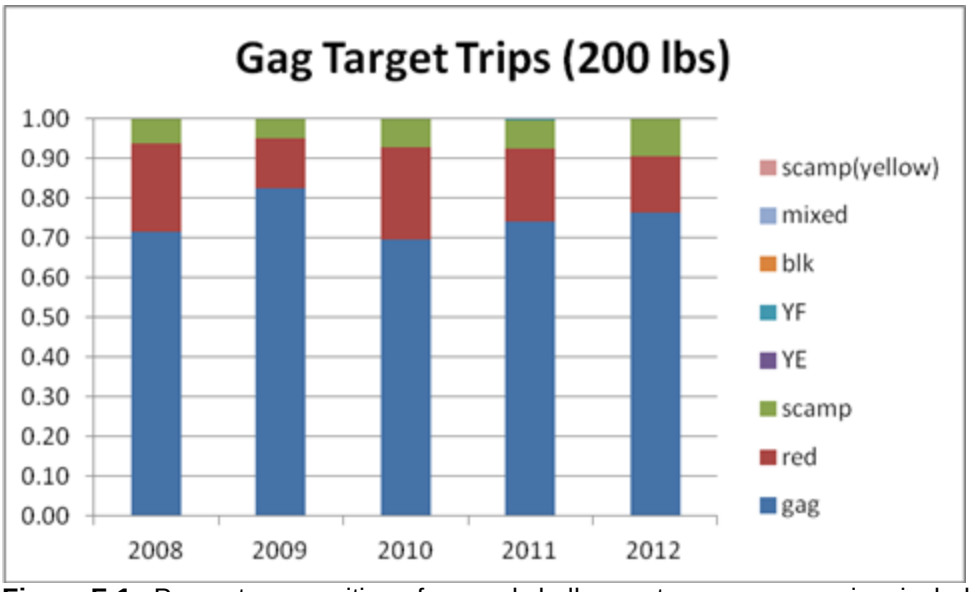

Figure F-1. Percent composition of several shallow-water grouper species, including gag, on trips targeting gag off North Carolina from 2008 to 2011.
Source: NC Division of Marine Fisheries, 2012

Similarly, the proportion of shallow water grouper species on trips targeting red grouper off North Carolina for the same time period is shown in **Figure F-2**.

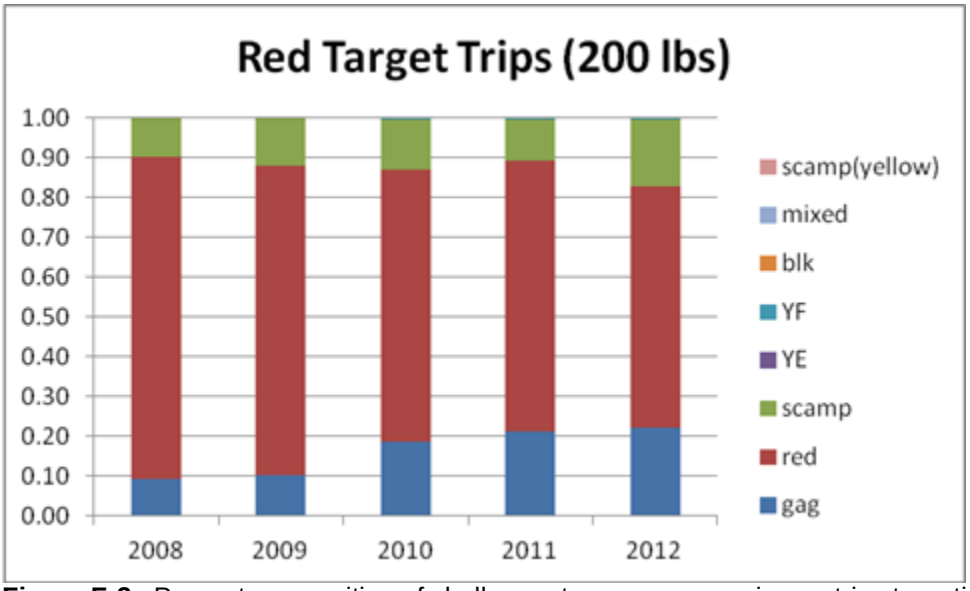

Figure F-2. Percent composition of shallow water grouper species on trips targeting red grouper off North Carolina from 2008 to 2011.
Source: NC Division of Marine Fisheries, 2012.

The red grouper landings comprise from 80% to 60% over the time period whereas landings of gag and scamp both increase over the time period from about from about 10% to about 20% of the trip total.

Considering the data shown in the figures above, fishermen are seemingly able to target gag effectively and keep their catch fairly "clean." On the other hand, the landings composition in trips targeting red grouper seems to be changing, becoming more mixed with gag and scamp. This suggests that perhaps average trips referenced as red target did not go as far offshore, to the areas where it is more red, and therefore encountered more of a mix.

Appendix G.

1 Bycatch Practicability Analysis (BPA)

1.1 Population Effects for the Bycatch Species

Background

Regulatory Amendment 15 to the Fishery Management Plan (FMP) for the Snapper Grouper Fishery of the South Atlantic Region (Regulatory Amendment 15) primarily affects gag, shallow water groupers, and yellowtail snapper. A stock assessment completed in 2006 indicated gag is experiencing overfishing and approaching an overfished condition (SEDAR 10 2006). Amendment 16 to the FMP for the Snapper Grouper Fishery of the South Atlantic Region (Amendment 16; SAFMC 2009a) established management measures to end overfishing of gag. These measures included a four-month (January-April) spawning season closure of the recreational and commercial harvest of shallow-water grouper species including gag, black grouper, red grouper, scamp, rock hind, red hind, coney, graysby, yellowfin grouper, yellowmouth grouper, and tiger grouper (removed from the FMP in 2011); a directed commercial annual catch limit (ACL) for gag; and a reduction in the recreational bag limits for shallow-water grouper species. Also included was a provision to close all shallow-water grouper species when the gag ACL was met or projected to be met. The intent of this action was to reduce incidental catch of gag. Prior to 2012, the gag ACL had never been met since it was implemented in 2009 and shallow-water groupers had never been closed as a result.

The state of Florida recently completed a stock assessment for yellowtail snapper (FWRI 2012), which indicated the species is neither overfished or undergoing overfishing. The South Atlantic Fishery Management Council's (South Atlantic Council) and the Gulf of Mexico Fishery Management Council's Scientific and Statistical Committees reviewed the assessment and determined the acceptable biological catch could be increased. Based on this information, the South Atlantic Council requested that the National Marine Fisheries Service (NMFS) implement a temporary rule for an emergency action to adjust the commercial ACL for the 2012 commercial fishing season for yellowtail snapper as soon as possible. An emergency rule was implemented to temporarily increase the commercial ACL during 2012. The Council intends to adjust the commercial and recreational ACLs and the recreational ACT for 2013 and beyond in Regulatory Amendment 15. In addition, the Council considered changes to the January 1 fishing year start date for the commercial and recreational sectors and the establishment of a commercial spawning season closure. The purpose of the actions is to benefit fishermen and fishing communities that utilize the yellowtail snapper portion of the snapper grouper fishery by minimizing the probability of closures during peak harvest times, and protect yellowtail snapper during spawning periods.

Commercial Sector

The species most associated with gag in the South Atlantic are gray triggerfish, red grouper, and red snapper (NMFS 2011). The species most associated with yellowtail snapper in the South Atlantic are black grouper, gray snapper, and lane snapper (NMFS 2011). Among these species, commercial harvest is greatest for gray triggerfish and red grouper (**Table G-1**).

Table G-1. Mean commercial estimates of landings and discards in the U.S. southern Atlantic Ocean (2007-2011).

Species	COMMERCIAL	
	Landings (pounds whole weight)	Discards (N)
Black grouper	59,427	3,031
Gag	592,108	9,185
Gray snapper	109,225	74,887
Gray triggerfish	427,642	2,091
Lane snapper	4,105	697
Red grouper	480,195	6,793
Schoolmaster	231	0
Red hind	11,883	147
Red porgy	179,256	27,671
Red snapper	148,820	19,561
Yellowtail snapper	949,257	128,323

Note: Commercial discard estimates are for vertical line gear only. Commercial gray triggerfish includes "triggerfishes, unclassified" category
Sources: Commercial landings data from SEFSC Commercial ACL Dataset (July 2012) with discard estimates from expanded SEFSC Commercial Discard Logbook (July 2012).

During 2010 and 2011, approximately 20% of snapper grouper permitted vessels from the Gulf of Mexico and South Atlantic were randomly selected to fill out supplementary logbooks. The average number of trips per year during 2010 and 2011 was 21,318; and fishermen spent an average of 1.66 days at sea per trip (**Table G-2**).

Table G-2. Snapper grouper fishery effort for South Atlantic.

Year	Trips	Days	Days per Trip
2010	13,387	22,347	1.67
2011	12,253	20,289	1.66
Mean	12,820	21,318	1.66

Source: NMFS SEFSC logbook program.

Release mortality estimates for the commercial sector compiled from the most recent stock assessments (as available) using Southeast Fishery Science Center's (SEFSC) Southeast Data, Assessment, and Review (SEDAR) process are: 48% red snapper (SEDAR 24 2010); 40% gag (SEDAR 10 2006); 1% black sea bass (SEDAR 25 2011); 38% vermilion snapper (SEDAR 17 2008); 20% red grouper and 20% black grouper (SEDAR 19 2010); 20% greater amberjack (SEDAR 15 2008); and 0% gray triggerfish (Gulf of Mexico SEDAR 9 2006). See the "Finfish Bycatch Mortality" and "Practicability of Management Measures in Directed Fisheries Relative to their Impact on Bycatch and Bycatch Mortality" sections of this BPA for more details.

Recreational Sector

For the recreational sector, estimates of the number of recreational discards are available from the Marine Recreational Fishery Statistical Survey (MRFSS) and Marine Recreational Information Program (MRIP) and the NMFS headboat survey. The MRIP system classifies recreational catch into three categories:

- Type A - Fishes that were caught, landed whole, and available for identification and enumeration by the interviewers.

- Type B - Fishes that were caught but were either not kept or not available for identification:

    - Type B1 - Fishes that were caught and filleted, released dead, given away, or disposed of in some way other than Types A or B2.

    - Type B2 - Fishes that were caught and released alive.

During 2007-2011, recreational harvest for gag and yellowtail snapper co-occurring species was greatest for gray snapper, gray triggerfish, and vermilion snapper (**Table G-3**).

Release mortality estimates for the recreational sector compiled from the most recent stock assessments using data from SEDAR stock assessments (as available) are: 25% gag (SEDAR 10 2006); 7% black sea bass (SEDAR 25 2011); 38% vermilion snapper (SEDAR 17 2008); 20% red grouper and 20% black grouper (SEDAR 19 2010); 20% greater amberjack (SEDAR 15 2008b); and 0% gray triggerfish (Gulf of Mexico SEDAR 9 2006). The recent assessment for yellowtail snapper conducted by the state of Florida estimates release mortality at 10% for the commercial and recreational sectors (FWRI 2012). Dead discards can be estimated by applying the release mortality rates to the total discards portrayed in **Table G-3**. Between 2007-2011, the number of discarded fish was highest for gray snapper for the private recreational sector (**Table G-3**). For both charter and headboats, the magnitude of discards was highest for vermilion snapper (**Table G-3**).

Table G-3. Mean headboat, MRIP charter and private, and commercial estimates of landings and discards for species in the snapper grouper fishery management unit in the U.S. southern Atlantic Ocean (2007-2011). Headboat, MRIP charter and private landings are in numbers of fish (N); commercial landings are in pounds whole weight (lbs ww).

	HEADBOAT				MRIP CHARTER				MRIP PRIVATE			
	Catch (N)	Landings (N)	Discards (N)	Discards (%)	Catch (N)	Landings (N)	Discards (N)	Discards (%)	Catch (N)	Landings (N)	Discards (N)	Discards (%)
Black grouper	1,551	464	1,086	70%	501	389	112	22%	15,115	2,962	12,153	80%
Gag	8,633	3,736	4,897	57%	8,085	3,787	4,298	53%	150,501	25,430	125,072	83%
Gray snapper	43,494	38,141	5,353	12%	7,291	6,142	1,149	16%	1,624,017	320,071	1,303,945	80%
Gray triggerfish *	68,648	58,654	9,995	15%	48,945	40,356	8,588	18%	255,833	119,986	135,847	53%
Lane snapper	22,610	19,297	3,313	15%	4,988	3,661	1,327	27%	204,274	55,511	148,762	73%
Red porgy	56,191	34,003	22,189	39%	24,792	14,996	9,796	40%	38,511	22,964	15,546	40%
Vermilion snapper	368,271	253,588	114,683	31%	79,351	46,643	32,708	41%	205,807	85,100	120,707	59%
Yellowtail snapper	128,528	95,882	32,646	25%	31,652	25,573	6,079	19%	427,752	197,021	230,731	54%

Note: Recreational MRIP data includes official MRIP 2004-2011 re-estimates and ratio-estimated MRIP catches (1986-2003)
*Commercial gray triggerfish includes "triggerfishes, unclassified" category. Red snapper are excluded from Table D-1 since they are prohibited species, and landings records are not available for all the years (2007-2011).
Sources: MRIP data from SEFSC Recreational ACL Dataset (October 2012), Headboat data from SEFSC Headboat Logbook CRNF files (expanded; July 2012),

Finfish Bycatch Mortality

SEDAR 10 (2006) estimated release mortality rates of 40% and 25% for gag taken by commercial and recreational fishermen, respectively. A tagging study conducted by McGovern et al. (2005) indicated recapture rates of gag decreased with increasing depth. The decline in recapture rate was attributed to depth-related mortality. Assuming there was no depth-related mortality at 0 m, McGovern et al. (2005) estimated depth related mortality ranged from 14% at 11-20 m (36-65 feet) to 85% at 71-80 m (233-262 feet). Similar trends in depth-related mortality were provided by a gag tagging study conducted by Burns et al. (2002). Overton et al. (2008) reported a post-release mortality for gag as 13.3%. With the exception of red grouper and black grouper, release mortality rates have not been estimated for other shallow-water grouper species, but could be similar to gag since they have a similar depth distribution. Rudershausen et al. (2007) estimated release mortality rates of 33% for undersized gag taken with J-hooks in depths of 25-50 m off North Carolina. For other gag caught at depths of 25-50 m, no immediate mortality was observed but delayed mortality was estimated to be 49%. McGovern et al. (2005) estimated a release mortality rate of 50% at 50 m, which is similar to the findings of Rudershausen et al. (2007). Rudershausen et al. (2007) concluded minimum size limits are effective for gag in the shallower portions of their depth range.

Release mortality rates were estimated as 20% for black grouper and red grouper taken by recreational fishermen in SEDAR 19 (2010) during the data workshop. Wilson and Burns (1996) reported potential mortality rates for released red grouper to be low (0-14%) as long as the fish were caught from waters shallower than 44 m. SEDAR 15 (2008) estimated a 20% release mortality rate for greater amberjack. In the Gulf of Mexico, SEDAR 9 (2006) assumed a 0% release mortality rate for gray triggerfish.

SEDAR 3 (2003) used a 30% release mortality rate for yellowtail snapper based upon MRFSS B1 fish and rough calculations from a small amount of discard data in commercial logbooks (Poffenberger 2003) for the all of the modeled fisheries (commercial, MRFSS, and headboat). The 2012 stock assessment used a release mortality rate of 10% for yellowtail snapper (FWRI 2012) in the commercial and recreational sectors. There have been no studies on the delayed mortality of yellowtail snapper after release from fishing gear, but there are programs, which collect information on the observable condition of fish immediately after release. The NMFS at-sea observers gather information on released fish from commercial long line and bandit reel reef fish trips and note release condition of fish. However, released yellowtail snapper are uncommon on those few observed trips (FWRI 2012). FWRI (2012) describes a new source of data collected by biologists on at-sea trips on headboat has accumulated recently, and it represents a more direct and unbiased source of several types of release data such as the size-at-release and the release mortality immediately observable after the release of fish off of Florida's Gulf Coast [funded during 2005-2007 by the Gulf States Marine Fisheries Commission's Fisheries Information Network (FIN) program] and off Florida's Atlantic Coast [funded during 2005-2010 by the Atlantic States Marine Fisheries Commission's Atlantic Coastal Cooperative Statistics Program (ACCSP)]. At-sea samplers were randomly assigned to ride headboats and observe (and interview) recreational anglers according to protocols established by the MRFSS. Samplers monitor a number of anglers fishing and identify and measure (if possible) fish caught by the angler that would be released. After measurement,

the sampler returns the fish to the angler and observes and records information about the release of the fish such as the reason for release, release condition of the fish, and whether the fish was able to swim down from the surface after release. Notes regarding predation (by birds, marine mammals, or other fish) on released fish were also part of data on the release mortality of yellowtail snapper are scarce.

A total of 1,364 MRFSS at-sea sampling trips were completed under the FIN and ACCSP programs from 2005-2010, and yellowtail snapper were seen by samplers in all areas except the Northwest Florida region. Yellowtail snapper were more usually observed on headboat trips in the Florida Keys, Southeast Florida, and the southern portion of Southwest Florida region (FWRI 2012). Most (97-100%) fish released alive and observed by the at-sea samplers were below the 12" TL minimum size limit. About 50% (36-83%; Type B2/Total Catch) of the yellowtail snapper caught were released alive on trips in the Florida Keys when an at-sea sampler was present, and 99% of the released fish observed were below the size limit based upon at-sea measurements by the samplers. Released yellowtail snapper from Southwest Florida and Southeast Florida were about 23% (19-26%) and 15% (11-27%) of the total catch, respectively, and 97% from both regions were observed to be undersized. Yellowtail snapper released by headboat anglers in the Florida Keys/Southwest Florida regions had an immediate release mortality rate of about 4.5%, and those fish released by headboat anglers in Southeast Florida/Northeast Florida regions had an immediate release mortality rate of 10.5% possibly as a result of deeper depths of capture in Southeast Florida compared with the areas normally fished in the Keys and Southwest Florida. The recent stock assessment for yellowtail snapper chose a rate of 10% release mortality as an approximation for the lower bound on release mortality for yellowtail snapper (FWRI 2012).

SEDAR 24 (2010) estimated acute release mortality rates of red snapper to be 48% for the commercial sector, 41% for recreational for-hire sector (charterboats and headboats), and 39% for the private recreational sector, in the South Atlantic. This stock assessment revised the release mortality estimate of 90% for the commercial sector as reported in SEDAR 15 (2008). There was no significant difference between the two stock assessments regarding the release mortality of red snapper in the recreational sector, which was 40%, as per the findings in SEDAR 15 (2008). Diamond and Campbell (2009) reported a delayed mortality rate of 64% off Texas. A study by Burns et al. (2004) conducted on headboats off Florida in the Atlantic and Gulf of Mexico found a release mortality of 64% for red snapper. The majority of acute mortalities in this study (capture depth of 9-42 m) were attributed to hooking (49%), whereas barotrauma accounted for 13.5%. An earlier study by Burns et al. (2002), also conducted in the Atlantic and Gulf of Mexico, had similar results, as J-hook mortality accounted for 56% of the acute mortalities of red snapper on headboats. Using tagging data and cage studies, Burns et al. (2002) determined the depth at which 50% of the released red snapper would die is 43.7 m (143 feet). SEDAR 15 (2008) indicated red snapper were most often caught at depths of 141-190 feet by the recreational sector and 141-234 feet by the commercial sector. Rummer and Bennett (2005) reported over 70 different overexpansion injuries related to barotrauma in red snapper, and Wilde (2009) observed reduced survival of this species when vented.

SEDAR 17 (2008) recommended a release mortality rate for vermilion snapper of 38% for both the commercial and recreational sectors. This was based on a mortality study conducted by

Ruderhshausen et al. (2007) who estimated release mortality rates of 15% for undersized vermilion snapper. Immediate mortality of vermilion snapper was estimated to be 10% at depths of 25-50 m and delayed mortality was estimated to be 45% at the same depths. Rudershausen et al. (2007) indicated minimum size limits are moderately effective in shallower water for vermilion snapper. Previously, SEDAR 2 (2003) estimated a release mortality rate of 40% and 25% for vermilion snapper taken by commercial and recreational fishermen, respectively. Release mortality rates for vermilion snapper from SEDAR 2 (2003) were based on cage studies conducted by Collins (1996) and Collins et al. (1999). Burns et al. (2002) suggested that release mortality rates of vermilion snapper could be higher than those estimated from cage studies because cages protect the fish from predators. A higher release mortality rate is supported by low recapture rates of vermilion snapper in tagging studies. Burns et al. (2002) estimated a 0.7% recapture rate for 825 tagged vermilion snapper; whereas, recapture rates for red grouper, gag, and red snapper ranged from 3.8% to 6.0% (Burns et al. 2002). McGovern and Meister (1999) estimated a 1.6% recapture rate for 3,827 tagged vermilion snapper. Alternatively, recapture rates could be low if population size was very high or tagged fish were unavailable to fishing gear. Harris and Stephen (2005) indicated approximately 50% of released vermilion snapper caught by one commercial fisherman were unable to return to the bottom. Lower recapture rates were estimated for black sea bass (10.2%), gray triggerfish (4.9%), gag (11%), and greater amberjack (15.1%) (McGovern and Meister 1999; McGovern et al. 2005). Burns et al. (2002) suggested released vermilion snapper did not survive as well as other species due to predation. Vermilion snapper that do not have air removed from swimbladders, are subjected to predation at the surface of the water. Individuals with a ruptured swim bladder or those that have air removed from the swim bladder are subject to bottom predators, since fish would not be able to join schools of other vermilion snapper hovering above the bottom (Burns et al. 2002). However, Wilde (2009) reports that venting appears to be increasingly harmful for fish captured from deep water.

Release mortality of black sea bass is considered to be low (7% for the recreational sector and 1% for the commercial sector) (SEDAR 25 2011) indicating minimum size limits are probably an effective management tool for black sea bass. McGovern and Meister (1999) report a recapture rate of 10.2% for 10,462 that were tagged during 1993-1998 suggesting that survival of released black sea bass is high. Rudershausen et al. (2007) reported a sub-legal discard rate of 12% for black sea bass. Collins et al. (1999) reported venting of the swim bladder yielded reductions in release mortality of black sea bass, and the benefits of venting increased with capture depth. The same study was analyzed by Wilde (2009) to suggest that venting increased the survival of black sea bass, although this was an exception to the general findings of Wilde's (2009) study.

Practicability of Management Measures in Directed Fisheries Relative to their Impact on Bycatch and Bycatch Mortality

Red porgy, red snapper, vermilion snapper, gray triggerfish, and almaco jack

The snapper grouper fishery represents many species occupying the same location at the same time such as vermilion snapper, scamp, and gag. Fishermen could harvest one of these species when targeting gag and yellowtail snapper, and return them to the water as "regulatory discards" (e.g., if the fish is under the size limit) or if undesirable. A portion of the population would not survive. Cluster analyses were conducted by the Southeast Regional Office (SERO 2010) to identify South Atlantic snapper grouper species that are commonly caught together. The analysis used data from the SEFSC logbook program (accessed 6 May 2010). Based on the evaluation of 136,005 commercial records from 2005-2009, gag were most commonly landed with red porgy, red snapper, vermilion snapper, gray triggerfish, and almaco jack.

Although fishery management actions can adversely impact non-target species, the proposed actions in Regulatory Amendment 15 are not anticipated to significantly increase bycatch of gag as studies conducted since the implementation of Amendment 16 to the FMP for the Snapper Grouper Fishery of the South Atlantic Region (Amendment 16; SAFMC 2009) suggest that gag are not closely associated with shallow-water grouper species other than scamp and red grouper. A detailed discussion on the biological effects of the proposed action, including the effect on bycatch, is contained in **Section 4.3.1** and is summarized below.

Regulations implemented through the requirements of the Reauthorized Magnuson-Stevens Fishery Management and Conservation (Magnuson-Stevens) Act have placed restrictions on species that co-occur with gag and have likely been more effective in reducing incidental catch of gag than the provision to close shallow-water grouper species when the gag quota is met. Additional protection to gag has been provided in the form of ACLs and accountability measures (AMs). Amendment 17B to the FMP for the Snapper Grouper Fishery of the South Atlantic Region (Amendment 17B; SAFMC 2010b) established ACLs and AMs for nine species in the South Atlantic snapper grouper fishery undergoing overfishing in 2009, including gag. Amendment 17B also established commercial and recreational ACLs and AMs for an aggregate of gag, red grouper, and black grouper. The Comprehensive ACL Amendment (SAFMC 2011c) established ACLs for snapper grouper species not undergoing overfishing including scamp as well as an aggregate of the remaining shallow-water grouper species (rock hind, red hind, coney, graysby, yellowfin grouper, and yellowmouth grouper).

The spawning season and in-season closures of species that co-occur with gag may be responsible for the low rate of commercial discards. Examination of discard logbook data shows that the rate (# of fish per hook hour) of discarded gag was very low in 2007-2010, and decreased in 2011. As the gag quota had never been met prior to 2012, the decline in discards is not due to closing shallow-water species when the gag quota is met, and is likely a result of other management measures that have reduced fishing effort on gag and co-occurring species.

For the action that would modify the gag AM, **Alternative 1 (No Action)** established through Amendment 16 (SAFMC 2009a) to close all shallow-water grouper species when the gag quota is met, is not having the intended effect of reducing incidental catch of gag. The gag quota had never been met prior to 2012 and, as mentioned previously, most of the shallow-water grouper species are not taken on the same trip as gag. The ACLs and AMs established for snapper grouper species in Amendment 17B (SAFMC 2010a), the Comprehensive ACL Amendment (SAFMC 2011c), Amendment 24 (SAFMC 2011d), and Amendment 17A(SAFMC 2010a), along with the four-month shallow-water grouper spawning season closure and five-month recreational closure for vermilion snapper, are providing greater protection for gag than the closure of shallow-water grouper species when the gag quota is met, as specified in **Alternative 1 (No Action)**. The gag quota was projected to be met on October 20, 2012, and resulted in a closure of all the shallow-water grouper species. While any closure would be expected to have positive biological effects on gag and other snapper grouper species, measures implemented since Amendment 16 appear to be reducing incidental catch of gag. Therefore, retention of the **Alternative 1 (No Action)** provision to close all shallow-water grouper species when the gag quota is met could have unnecessary economic and social impacts as it is not likely needed to ensure that overfishing of gag does not occur.

Alternative 2 would retain existing AMs for all shallow water groupers, except for gag. Instead of prohibiting harvest of all shallow-water grouper when the gag ACL is met or projected to be met, **Alternative 2** would only prohibit harvest of gag, while harvest of the remainder of the shallow water groupers would be constrained by their respective ACLs (red grouper, black grouper and scamp) or by the Shallow-Water Grouper Complex ACL (red hind, rock hind, yellowfin grouper, yellowmouth grouper, graysby and coney). In general, the biological benefits of **Alternative 2** could be less than those of **Alternative 1 (No Action)**, but harvest of all species would continue to be dictated by the established ACLs, thus ensuring that overfishing does not occur.

In terms of gag bycatch, **Alternative 2** could result in small biological impacts. Recent studies suggest that with the exception of red grouper and scamp, gag are not as closely associated in the landings with other shallow-water grouper species. Red grouper, which co-occur with gag based on trip-level data, can be targeted effectively to avoid encounters with gag. A clear separation is evident between trips that targeted gag versus those that targeted red grouper. Moreover, fishermen have stated that the two species can be effectively targeted, particularly off North Carolina.

Preferred Alternative 3 is similar to **Alternative 2** in that the prohibition on harvest of all shallow-water groupers when the gag ACL is met or projected to be met would be removed. However, **Preferred Alternative 3** would allow for an adjustment to the current commercial gag ACL to account for discard mortality after the closure. The current commercial ACL for gag was specified originally in Amendment 16 (SAFMC 2009a). However, the ACL was lowered by 1,000 pounds gutted weight to account for dead discards of gag that might occur after the gag quota had been met. The 4-month closure and the adjusted ACL are still in place. **Preferred Alternative 3** proposes to further reduce the commercial ACL for gag to account for any discard mortality that would result from targeting other shallow water groupers including red grouper and scamp after the gag quota has been met. It is expected the biological benefits of **Preferred**

Alternative 3 for gag would be greater than **Alternative 2** but similar to **Alternative 1 (No Action)**. As ACLs and AMs are in place for red grouper, scamp, black grouper, and other shallow-water groupers, **Alternative 3** would allow for optimum yield for these species to be achieved. Under the **Alternative 1 (No Action)**, harvest of these species is constrained.

Yellowtail snapper

Measures in Regulatory Amendment 15 include alternatives to increase the ACL for yellowtail snapper based on the results of a new stock assessment, change the start of the fishing year, and establish a spawning season closure. The results of a new stock assessment indicate the ACL for yellowtail snapper can be increased, making the likelihood of an in-season closure for the commercial sector less likely. Some discards of yellowtail snapper could be expected during an in-season closure if the species is taken incidentally when targeting co-occurring species. However, commercial fishermen specifically target yellowtail snapper and fish differently for the species than for other snapper grouper species. Therefore, if an in-season closure for yellowtail snapper occurred, it is not likely to increase bycatch of the species. Similarly, a spawning season closure may reduce bycatch of yellowtail snapper by removing targeting of the species. However, bycatch could occur if other fish are targeted and yellowtail snapper are incidentally caught. As yellowtail snapper are specifically targeted by the commercial sector incidental catch of other snapper grouper species might not be significant. Some bycatch could occur during a recreational closure for yellowtail snapper; however, the overall magnitude of yellowtail snapper mortality would be expected to decrease; thereby providing a biological benefit to a species when it may be vulnerable to fishing pressure in spawning aggregations. Release mortality of yellowtail snapper is very low (10%) so good survival is expected from individuals which are incidentally caught and released.

Other measures that have reduced bycatch of species in Regulatory Amendment 15

Amendment 14 to the FMP for the Snapper Grouper Fishery of the South Atlantic Region (Amendment 14; SAFMC 2007) established eight marine protected areas (MPAs) along the east coast of the United States where harvest and possession of snapper grouper species is prohibited. In addition to providing a refuge for deepwater snapper grouper species, the intent of Amendment 14 is also to protect known spawning areas of snapper grouper species. Many of the species addressed by Regulatory Amendment 15 are known to spawn within the MPAs including gag, scamp, red grouper, and others.

Unobserved mortality to snapper grouper species due to predation or trauma associated with capture could be substantial with snapper-grouper species (Burns et al. 2002; Rummer and Bennett 2005; St. John and Syers 2005; Parker et al. 2006; Rudershausen et al. 2007; Hannah et al. 2008; Diamond and Campbell 2009). Amendment 16 (SAFMC 2009a) also included actions that required the use of dehooking devices, which could help reduce bycatch 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 could still reduce handling time in removing hooks, thus increasing survival (Cooke et al. 2001).

Amendment 17A (SAFMC 2010a) implemented regulations requiring the use of non-stainless circle hooks north of 28 degrees N. latitude, effective March 2, 2011. Circle hooks are generally thought to reduce discard mortality rate for red snapper (SEDAR 7 2005; Rummer 2007); however, Burns et al. (2004) did not observe decreased discard mortality rate when comparing recapture rates of red snapper caught on circle and J-hooks. Rummer (2007), and Diamond and Campbell (2009) found that a greater differential between the surface and bottom temperature caused a higher discard mortality rate for red snapper. Amendment 17B to the Snapper Grouper FMP (Amendment 17B; SAFMC 2010b) established ACLs and AMs and addressed overfishing for eight species in the snapper grouper management complex currently listed as undergoing overfishing: golden tilefish, snowy grouper, speckled hind, warsaw grouper, black sea bass, gag, red grouper, and vermilion snapper, in addition to black grouper.

The Comprehensive ACL Amendment (SAFMC 2011c) implemented ACLs and AMs for species not undergoing overfishing in four fishery management plans, in addition to other actions such as allocations and establishing annual catch targets for the recreational sector. The Comprehensive ACL Amendment 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 (Amendment 18A; SAFMC 2012a) contains measures to limit participation and effort for black sea bass, and does not directly affect gag or yellowtail snapper. Amendment 18A established an endorsement program that enables snapper grouper fishermen with a certain catch history to harvest black sea bass with pots. In addition, Amendment 18A (SAFMC 2012a) included measures to reduce bycatch in the black sea bass pot fishery, modify the rebuilding strategy, and other necessary changes to management of black sea bass as a result of a 2011 stock assessment (SEDAR 25 2011).

Amendment 24 to the Snapper Grouper FMP (Amendment 24; SAFMC 2011d) established a rebuilding plan for red grouper, which is overfished and undergoing overfishing. Amendment 24 also established ACLs and AMs for red grouper, which could help to reduce bycatch of red grouper and co-occurring species such as gag. The January-April spawning season closure established in Amendment 16 (SAFMC 2009a) was sufficient to end overfishing of red grouper.

1.2 Ecological Effects Due to Changes in the Bycatch

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.

The management measures for yellowtail snapper in **Actions 1** and **2** of Regulatory Amendment 15 would not be expected to substantially change the magnitude of bycatch, particularly if an increase in the ACL is selected as the preferred alternative in **Action 1**.

Alternative 2 of **Action 3** in Regulatory Amendment 15 would retain existing AMs for all shallow-water groupers, except for gag. Instead of prohibiting harvest of all shallow-water grouper when the gag ACL is met or projected to be met, **Alternative 2** would only prohibit harvest of gag while harvest of the remainder of the shallow-water groupers would be constrained by their respective ACLs (red grouper, black grouper, and scamp) or by the Shallow-Water Grouper Complex ACL (red hind, rock hind, yellowfin grouper, yellowmouth grouper, graysby, and coney). In general, the biological benefits of **Alternative 2** could be less than those of **Alternative 1 (No Action)**, but recent studies suggest that gag are not as closely associated in the landings with the rest of the shallow water grouper species as was previously thought. A detailed discussion on the biological effects of the proposed action, including the effect on bycatch, is contained in **Section 4.3.1**. **Alternative 3** is similar to **Alternative 2** in that harvest of shallow-water groupers could occur after the gag quota is met. However, unlike **Alternative 2**, **Preferred Alternative 3** would reduce the gag by the amount of dead discards that could be expected to occur when fishermen target co-occurring shallow-water grouper species (i.e. red grouper and scamp). Therefore, for gag the biological effects of **Preferred Alternative 3** would be expected to be greater than **Alternative 2** but similar to **Alternative 1 (No Action)**.

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

In terms of gag bycatch, **Alternative 2** would result in small biological impacts, and **Preferred Alternative 3** would result in bycatch levels similar to **Alternative 1 (No Action)**. Recent studies indicate that other than red grouper and scamp, gag are not as closely associated in the landings with other shallow water grouper species. Red grouper, which co-occur with gag based on trip-level data, can be targeted effectively to avoid encounters with gag. A clear separation is evident between trips that targeted gag versus those that targeted red grouper. Moreover, fishermen have stated that the two species can be effectively targeted, particularly off North Carolina.

For the action that would affect yellowtail snapper, an increase in the ACL makes an in-season closure of the species unlikely, regardless of the start date of the fishing year. A change in the magnitude of bycatch is not expected. A spawning season closure may reduce bycatch by removing targeting of the species. Commercial fishermen target yellowtail snapper differently than other snapper grouper species, and incidental catch of the species during a closure is not expected. However, some limited bycatch could occur if other species are targeted and yellowtail snapper are incidentally caught. Since the release mortality of yellowtail snapper is low (10%), any change in the magnitude of dead discards associated with a spawning season closure would be expected to be minor.

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 2012 LOF classifies as a Category II (76 FR 73912; November 26, 2011). 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 2001. 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 2012 LOF (76 FR 73912; November 26, 2011) as Category III fisheries.

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). There are no known interactions between the black sea bass pot sector and large whales. NMFS's biological opinion on the continued operation of the South Atlantic snapper grouper fishery determined the possible adverse effects resulting from the fishery are extremely unlikely.

North Atlantic right and humpback whales may overlap both spatially and temporally with the black sea bass pot fishery. Revisions to the Atlantic Large Whale Take Reduction Plan folded the Atlantic mixed species trap/pot fisheries into the plan (72 FR 57104; October 5, 2007). The new requirements will help further reduce the likelihood of North Atlantic right and humpback whale entanglement in black sea bass pot gear.

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 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 U.S. 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

Actions in Regulatory Amendment 15 would be expected to affect the cost of fishing operations. It is likely that all four states (North Carolina, South Carolina, Georgia, and Florida) within the Council's jurisdiction would be affected by the regulations. Additionally, factors such as waterfront property values, availability of less expensive imports, etc. may affect economic decisions made by recreational and commercial fishermen. Amendment 18A (SAFMC 2012a) and the Comprehensive Ecosystem-Based Amendment 3 (under development) include actions to enhance current bycatch data collection programs. This might provide more insight into calculating the changes in fishing, processing, disposal, and marketing costs.

1.6 Changes in Fishing Practices and Behavior of Fishermen

Actions proposed in Regulatory Amendment 15 could result in a modification of fishing practices by commercial and recreational fishermen, thereby affecting the magnitude of discards. However, it is difficult to quantify any of the measures in terms of reducing discards until the magnitude of bycatch has been monitored over several years.

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

Research and monitoring is needed to understand the effectiveness of proposed management measure and their effect on bycatch. The states and the SEFSC made efforts to enhance data collection activities during the limited opening for red snapper in September 2012. In addition, the NMFS' MRFSS has regularly collected angler-reported data on dead discards (included with their "Type B1" fish) and live released fish ("Type B2") since 1981. The NMFS Beaufort Headboat Survey has collected reports of live and dead discards from headboat captains on their vessel catch logs beginning in 2004. The NMFS coastal logbooks have required a sample of commercial fishermen to report the quantity of fish discarded by species beginning in 2002, but estimates of release mortality come from trips with at-sea observers on board. 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. There are general concerns about self-reported data and bycatch reporting because of issues such as recall bias, prestige bias, rounding (i.e., digit bias, "dozens", tens, etc.), and perhaps a perception by some fishermen that the accurate reporting of bycatch or discards may lead to future management actions and reduced levels of allowable catch.

Additional data collection activities for the recreational sector are being considered in the Comprehensive Ecosystem-Based Amendment 3 (under development) that could allow for a better monitoring of snapper grouper bycatch in the future. The use of electronic logbooks could

be enhanced to enable fishery managers to obtain information on species composition, size distribution, geographic range, disposition, and depth of fishes that are released. Some observer information has been provided by Marine Fisheries Initiative and Cooperative Research Programs, but more is needed for the snapper grouper fishery.

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

Preferred alternatives for actions concerning yellowtail snapper and shallow-water groupers, including those that could possibly affect the magnitude of discards, could result in social and/or economic impacts as discussed in **Chapter 4** of Regulatory Amendment 15.

1.9 Changes in the Distribution of Benefits and Costs

Management measures proposed for yellowtail snapper and shallow-water groupers have the potential to impact bycatch of snapper grouper species. See earlier section titled, "Practicability of Management Measures in Directed Fisheries Relative to their Impact on Bycatch and Bycatch Mortality", in this BPA for a list of amendments and a summary of actions within them that could help reduce bycatch and discard mortality in the snapper grouper fishery.

1.10 Social Effects

The social effects of all the alternatives, including those most likely to affect bycatch, are described in **Chapter 4** of Regulatory Amendment 15.

1.11 Conclusion

This section evaluates the practicability of taking additional action to minimize bycatch and bycatch mortality in the South Atlantic snapper grouper fishery using the ten factors provided at 50 CFR 600.350(d)(3)(i). In summary, some discards of yellowtail snapper could be expected during an in-season closure if yellowtail snapper taken incidentally when targeting co-occurring species. However, commercial fishermen specifically target yellowtail snapper and fish differently for the species than for other snapper grouper species. Therefore, an in-season closure for yellowtail snapper is not likely to increase bycatch. Increasing the ACL and changing the fishing year are not likely to change the magnitude of bycatch of yellowtail snapper. Similarly, a spawning season closure may reduce bycatch of yellowtail snapper by removing targeting of the species. Bycatch could occur if other fish are targeted and yellowtail snapper are incidentally caught; however, release mortality of yellowtail snapper is low (10%) and most released yellowtail snapper would be expected to survive incidental capture during a harvest prohibition.

.

Alternative 2 for **Action 3** would only prohibit harvest of gag while harvest of the remainder of the shallow-water groupers would be constrained by their respective ACLs (red grouper, black grouper and scamp) or by the Shallow-Water Grouper Complex ACL (red hind, rock hind, yellowfin grouper, yellowmouth grouper, graysby and coney). In general, the biological benefits of **Alternative 2** could be less than those of **Alternative 1 (No Action)**, but harvest of all species would continue to be dictated by the established ACLs, thus ensuring that overfishing does not occur.

In terms of gag bycatch, **Alternative 2** would result in low biological impacts. Recent studies suggest that, with the exception of red grouper and scamp, gag are not commonly landed with other shallow-water grouper species. Red grouper, which co-occur with gag based on trip-level data, can targeted effectively to avoid encounters with gag. **Preferred Alternative 3** is similar to **Alternative 2** in that the prohibition on harvest of all shallow-water groupers when the gag ACL is met or projected to be met would be removed. However, **Preferred Alternative 3** would allow for an adjustment to the current commercial gag ACL to account for discard mortality after the closure. The current commercial ACL for gag was specified originally in Amendment 16. However, the ACL was lowered by 1,000 pounds gutted weight to account for post-quota bycatch mortality (PQBM). This adjustment, in addition to the January-April annual closure of shallow-water groupers, resulted in the necessary reduction in harvest to end overfishing of gag. The four-month closure and the adjusted ACL are still in place. **Alternative 3** proposes to further reduce the commercial ACL for gag to account for any discard mortality that would result from harvest of other shallow-water groupers after gag is closed. For gag, **Preferred Alternative 3** would be expected to have a greater biological effect for gag than **Alternative 2** but a similar biological effect as **Alternative 1 (No Action)**. **Preferred Alternative 3** would allow for increased harvest of red grouper, scamp, black grouper, and other shallow water groupers; however, no negative biological effects would be expected for these species because harvest would be constrained by ACLs and AMs to ensure overfishing does not occur. In contrast to **Alternative 1 (No Action)**, **Preferred Alternative 3** would allow optimum yield to be achieved for these species.

The requirement of dehooking devices, a recreational/commercial seasonal closure for gag, reduction of recreational bag limits, a four-month spawning season closure for all shallow-water groupers, and a November through March recreational closure for vermilion snapper specified in Amendment 16 (SAFMC 2009a) have likely reduced bycatch of gag and co-occurring species. Furthermore, the prohibition of possession and harvest of red snapper implemented through Amendment 17A (SAFMC 2010a) has likely contributed to decreases in bycatch of gag, yellowtail snapper, and other co-occurring species. However, the magnitude of bycatch decrease depends on if fishermen shift effort to other species, seasons, or fisheries and if effort decreases in response to more restrictive management measures as well as changes in community structure and age/size structures that could result from ending overfishing. Furthermore, overall fishing effort could decrease in the commercial and recreational sectors in response to more restrictive management measures, thereby reducing the potential for bycatch.

ACLs and AMs established by Amendment 17B (SAFMC 2010b) and the Comprehensive ACL Amendment (SAFMC 2011c) could help reduce bycatch by limiting the amount of harvest, and provide for accountability if the ACL is exceeded. Management measures in Amendment

17B limit harvest of co-occurring species (black grouper, red grouper), and could help reduce discard mortality of gag and yellowtail snapper. Amendment 24 (SAFMC 2011d) specifies ACLs and AMs for red grouper, which could reduce bycatch of red grouper co-occurring species such as gag.

Finally, at their June 2012 meeting the Council requested development of a regulatory amendment to adjust management measures for greater amberjack, vermilion snapper, black sea bass, gray triggerfish, and vermilion snapper, which could also impact levels of bycatch of snapper grouper species.

REFERENCES

Alsop, III, F.J. 2001. Smithsonian Handbooks: Birds of North America eastern region. DK Publishing, Inc. New York, NY.

Burns, K.M., C.C. Koenig, and F.C. Coleman. 2002. Evaluation of multiple factors involved in release mortality of undersized red grouper, gag, red snapper, and vermilion snapper. Mote Marine Laboratory Technical Report No. 790.

Burns, K.M., N.F. Parnell, and R.R. Wilson. 2004. Partitioning release mortality in the undersized red snapper bycatch: comparison of depth versus hooking effects. Mote Marine Laboratory Technical Report No. 932.

Collins, M.R. 1996. Survival estimates for demersal reef fishes released by anglers. Proc. Gulf Caribb. Fish. Inst. 44:259-269.

Collins, M.R., J.C. McGovern, G. R. Sedberry, H.S. Meister, and R. Pardieck. 1999. Swim bladder deflation in black sea bass and vermilion snapper: potential for increasing post-release survival. North American. Journal of Fisheries Management 19:828-832.

Cooke, S.J., Philipp, D.P. Dunmall, K.M., and J.F. Schreer. 2001. The influence of terminal tackle on injury, handling time, and cardiac disturbance of rock bass. North American Journal of Fisheries Management. Vol. 21, no. 2, pp. 333-342.

Diamond, S.L. and M.D. Campbell. 2009. Linking “sink or swim” indicators to delayed mortality in red snapper by using a condition index. Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science 1:107-120.

Fish and Wildlife Research Institute (FWRI). 2012. The 2012 Stock Assessment Report for Yellowtail Snapper in the South Atlantic and Gulf of Mexico. Prepared by Joe O’Hop, Mike Murphy, and Dave Chagaris. 63 pp.

Hannah, R.W., Parker, S.J., and K.M. Matteson. 2008. Escaping the surface: the effect of capture depth on submergence success of surface-released Pacific rockfish. North American Journal of Fisheries Management 28: 694-700.

Harris, P.J. and J. Stephen. 2005. Final Report Characterization of commercial reef fish catch and bycatch off the southeast coast of the United States. CRP Grant No. NA03NMF4540416.

McGovern, J.C. and H.M. Meister. 1999. Data Report on MARMAP Tagging Activities From the Southeast Coast of the United States. MARMAP Data Report.

McGovern, J.C., G.R. Sedberry, H.S. Meister, T.M. Westendorff, D.M. Wyanski, and P.J. Harris. 2005. A Tag and Recapture Study of Gag, *Mycteroperca microlepis*, from the Southeastern United States. Bull. Mar. Sci. 76:47-59.

NMFS (National Marine Fisheries Service). 2010. Interim Rule for Red Snapper. Federal Register, September 24, 2010 (Volume 75, Number 185).

Overton, A.S., Zabawski, J., and K.L. Riley. 2008. Release mortality of undersized fish from the snapper-grouper complex off the North Carolina coast. North American Journal of Fisheries Management. 28: 733-739.

Parker, S.J., McElderry, H.I., Rankin, P.S., and R.W. Hannah. 2006. Buoyancy regulation and barotrauma in two species of nearshore rockfish. Transactions of the American Fisheries Society. 135: 1213-1223.

Poffenberger, J. 2003. Discard estimates: South Atlantic region. Southeast Data, Assessment, and Review SEDAR 4-DW-12.

Rudershausen, P.J., J.A. Buckel and E.H. Williams. 2007. Discard composition and release fate in the snapper and grouper commercial hook-and-line fishery in North Carolina, USA, Fish. Man. Ecol. 14:103–113.

Rummer, J.L. and W.A. Bennett. 2005. Physiological effects of swim bladder overexpansion and catastrophic decompression on red snapper. Transactions of the American Fisheries Society. 134(6): 1457-1470.

Rummer, J.L. 2007. Factors affecting catch and release (CAR) mortality in fish: Insight into CAR mortality in red snapper and the influence of catastrophic decompression. American Fisheries Society. 60:123-144.

SAFMC (South Atlantic Fishery Management Council). 2007. Amendment 14 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Impact Statement, Biological Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 601 pp. with appendices.

SAFMC (South Atlantic Fishery Management Council). 2009a. Amendment 16 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final

Environmental Impact Statement, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 608 pp. plus appendices.

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

SAFMC (South Atlantic Fishery Management Council). 2010b. Amendment 17B to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 406 pp. plus appendices.

SAFMC (South Atlantic Fishery Management Council). 2011c. Comprehensive Annual Catch Limit Amendment for the South Atlantic Region with Final Environmental Impact Statement, Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 755 pp. plus appendices.

SAFMC (South Atlantic Fishery Management Council). 2011d. Amendment 24 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 256 pp. plus appendices.

SAFMC (South Atlantic Fishery Management Council). 2012a. Amendment 18A to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Impact Statement, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 292 pp. plus appendices.

SEDAR 3. 2003. Stock Assessment Report: Southeastern U.S. Yellowtail Snapper. Available from the SEDAR website: www.sefsc.noaa.gov/sedar/

SEDAR 2. 2005. Stock Assessment Report 2. Report of stock assessment: South Atlantic Vermilion snapper. Stock Assessment Report 3 (revised June, 2006). Report of stock assessment: Black sea bass. Available from the SEDAR website: www.sefsc.noaa.gov/sedar/

SEDAR 7. 2004. Stock Assessment Report 1 (Gulf of Mexico Red Snapper). Available from the SEDAR website: www.sefsc.noaa.gov/sedar/

SEDAR 9. 2006. Stock Assessment Report 1 (Gulf of Mexico Gray Triggerfish). Available from the SEDAR website: www.sefsc.noaa.gov/sedar/

SEDAR 10. 2006. Stock assessment of gag in the South Atlantic. Available from the SEDAR website: www.sefsc.noaa.gov/sedar/

SEDAR 15. 2008. Stock Assessment Report 1 (revised March, 2009). South Atlantic Red Snapper. Stock Assessment Report 2: Greater Amberjack. Available from the SEDAR website: www.sefsc.noaa.gov/sedar/

SEDAR 17. 2008. Stock Assessment Report. South Atlantic Vermilion Snapper. Available from the SEDAR website: www.sefsc.noaa.gov/sedar/

SEDAR 19. 2010. Stock Assessment Report 1 (South Atlantic and Gulf of Mexico Black Grouper); and Stock Assessment Report 2 (South Atlantic Red Grouper). Available from the SEDAR website: www.sefsc.noaa.gov/sedar/

SEDAR 24. 2010b. Stock Assessment Report. South Atlantic Red Snapper. Available from the SEDAR website: www.sefsc.noaa.gov/sedar/

SEDAR 25. 2011. Stock Assessment Report. Black Sea Bass and Golden Tilefish. Available from the SEDAR website: www.sefsc.noaa.gov/sedar/

SERO (NOAA Fisheries Service Southeast Regional Office). 2010. Regulatory Amendment 11: Warsaw Grouper and Speckled Hind Catches in the U.S. South Atlantic. June 1, 2011 (revised August 23, 2011). SERO-LAPP-2011-06. 2011. 18 pp.

St. John, J. and C.J. Syers. 2005. Mortality of the demersal West Australian dhufish, (Richardson 1845) following catch and release: the influence of capture depth, venting and hook type. Fisheries Research. 76: 106-116.

Wilde, G.R. 2009. Does venting promote survival of released fish? Fisheries Management. 34(1): 20-28.

Wilson, R.R. and K.M. Burns. 1996. Potential survival of released groupers caught deeper than 40 m based on shipboard and *in-situ* observations, and tag-recapture data. Bulletin of Marine Science. 58(1): 234-247.

APPENDIX H

1.0 REGULATORY IMPACT REVIEW

1.1 Introduction

The National Marine Fisheries Service requires a Regulatory Impact Review (RIR) for all regulatory actions that are of public interest. The RIR does three things: 1) provides a comprehensive review of the level and incidence of impacts associated with a proposed or final regulatory action; 2) provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives that could be used to solve the problem; and 3) ensures that the regulatory agency systematically and comprehensively considers all available alternatives so that the public welfare can be enhanced in the most efficient and cost-effective way. The RIR also serves as the basis for determining whether the proposed regulations are a "significant regulatory action" under the criteria provided in Executive Order (E.O.) 12866 and provides some information that may be used in conducting an analysis of impacts on small business entities pursuant to the Regulatory Flexibility Act (RFA). This RIR analyzes the impacts that the proposed management alternatives in this rule would be expected to have on the yellowtail snapper and shallow water grouper component of the South Atlantic snapper grouper fishery.

1.2 Problems and Objectives

The problems and objectives addressed by this action are discussed in **Section 1.4** of this document and are incorporated herein by reference. In summary, the objectives of this action are to ensure yellowtail snapper ACLs are based on the best available science regarding stock status of this species in the South Atlantic; enhance socioeconomic benefits to fishermen and fishing communities that utilize the yellowtail snapper component of the snapper grouper fishery; and reduce adverse socioeconomic effects to fishermen and fishing communities that utilize the shallow water grouper component of the snapper grouper fishery.

1.3 Description of Fisheries

A description of the South Atlantic snapper grouper fishery and the yellowtail snapper and shallow water grouper components thereof is provided in **Chapter 3** of this document and is incorporated herein by reference.

1.4 Impacts of Management Measures

1.4.1 Action 1: Revise Annual Catch Limit (ACL) and Optimum Yield (OY) for Yellowtail Snapper

A detailed analysis of the economic effects expected to result from this action is provided in **Section 4.1.2** and is incorporated herein by reference. Specifically, **Preferred Alternative 2** is expected to lead to an increase in gross revenue of approximately $1.3 million for the commercial sector and a potential increase of approximately $4.68 million in consumer surplus for the recreational sector relative to **Alternative 1 (No Action)**.

Annual commercial landings of yellowtail snapper were 895,145 lbs (gw) on average from 2007-2011, generally trended upward during that time, and were 1,026,374 lbs (gw) in 2011. Thus, the 2011 landings were basically equivalent to the commercial ACL implemented in 2012 of 1,029,421 lb (gw) under **Alternative 1 (No Action)**, or rather the commercial ACL that existed prior to the current temporary rule and would exist upon its expiration. In effect, for the commercial sector, the status quo and 2011 conditions are equivalent. As such, the potential increase in gross revenue under this action is likely to occur as commercial vessels are expected to take full advantage of any increase in the commercial ACL.

In addition, with respect to the estimated changes in gross revenues in the commercial sector, it is possible these estimates could represent changes in net revenue if vessels can increase their landings of yellowtail snapper without increasing their effort (i.e., trips) and thereby costs, which is quite possible given that vessels were able to achieve about the same level of landings in 2011 as in 2009 but with approximately 16% less effort. However, if vessels do take more trips, it is likely that gross revenue from other species will also increase, at least to some extent. These increases may not be proportional to the increase in yellowtail snapper gross revenue as ACLs for these other species (e.g., gag, vermilion snapper, etc.) may restrict harvest increases. Thus, it is possible the actual gains in gross revenue and economic benefits for the commercial sector under **Alternative 2 (Preferred)** have been underestimated.

Conversely, the potential increase in consumer surplus for the recreational sector is unlikely to occur, at least in the short-term. Annual recreational landings of yellowtail snapper were 541,301 lbs (ww) on average from 2007-2011, trended downward during this time, and were only 390,998 lbs (ww) in 2011. Thus, average and 2011 recreational landings were substantially less than the recreational ACL, under **Alternative 1 (No Action)**. As such, the current recreational ACL is not constraining harvest in the private recreational or for-hire sectors at the present time and likely will not constrain it in the near future.

Further, the expected effect on NOR for for-hire vessels is uncertain. Since the for-hire and private recreational sectors do not have separate allocations, it is unknown how potential changes in the recreational ACL and recreational landings would be allocated

between the for-hire and private recreational sectors. Thus, changes in NOR for the for-hire sector cannot be estimated.

However, if landings in the recreational sector increase in the future, and those increases allow the for-hire sector to increase its harvests beyond what would have otherwise occurred without the increase in the recreational ACL, then consumer surplus in the recreational sector and NOR in the for-hire sector would be expected to increase as a result. Thus, although increases in consumer surplus and NOR are not expected in the short-term, increases may occur in the long-term.

1.4.2 Action 2: Yellowtail Snapper: Commercial and Recreational Fishing Year and Commercial Spawning Season Closure

A detailed analysis of the economic effects expected to result from this action is provided in **Section 4.2.2** and is incorporated herein by reference. No direct or indirect economic effects are expected under **Preferred Alternative 1 (No Action)** as this maintains the status quo. However, by taking no action with respect to a potential spawning closure, the full effects resulting from the increased commercial ACL under Action 1 are expected to occur.

1.4.3 Action 3: Gag and Shallow Water Groupers: Commercial Annual Catch Limit and Accountability Measures

A detailed analysis of the economic effects expected to result from this action is provided in **Section 4.3.2** and is incorporated herein by reference. **Alternative 1 (No Action)** would retain the current accountability measure (AM), which would close the entire shallow water grouper complex if the commercial ACL for gag is met or projected to be met. In 2012, such a closure occurred on October 20. According to the 2011 logbook data, 4,453 snapper grouper commercial trips occurred between October 20 and December 31. The gross revenue from these trips was $4,726,883. Of these 4,453 trips, 510 trips targeted species in the SWG complex, where the trip's target species is represented by the species accounting for the highest proportion of gross revenue on the trip. The total gross revenue from landings of all species on these trips was $1,209,990. It is assumed these trips did not occur in 2012 as a result of the closure and would not occur in the future if the AM remains as is. In addition, landings of gag from trips targeting species other than SWG accounted for an additional $29,960 in gross revenue. Thus, the total loss in gross revenue under **Alternative 1 (No Action)** is estimated to be $1,239,950.

Under **Alternative 3 (Preferred)**, it is assumed the trips targeting SWG that were canceled under **Alternative 1 (No Action)** would have occurred unless they targeted gag. That is, trips targeting gag would still be canceled under **Alternative 3 (Preferred)**. There were 336 trips that targeted gag between October 20 and December 31, 2011. The gross revenue from all species on those trips was $901,544. In addition, landings of gag

from trips targeting species other than gag and SWG would also not be retained under **Alternative 3 (Preferred)**. These landings accounted for an additional $74,563 in gross revenue. Thus, the loss in gross revenue from the cancelation of trips targeting SWG other than gag and the loss of gag landings from other trips due to a closure for gag is estimated to be $976,107 in absolute terms. Thus, the resulting loss in gross revenue is $263,843 less than under **Alternative 1 (No Action)**, which in effect represents a gain of $263,843 in gross revenue relative to **Alternative 1 (No Action)**.

However, the reduction in the commercial ACL under **Preferred Alternative 3** would partially offset that gain. Specifically, a lower commercial ACL would be expected to cause an earlier closure of gag than under **Alternative 1 (No Action)**. It is not possible to accurately predict how much earlier that closure would occur based on currently available data. Thus, a simpler approach to estimating the loss in gross revenue due to the reduced ACL is employed. Specifically, the difference between the current and proposed commercial ACL is 26,218 lbs (gw). Given an average price of $5.42/lb for gag in 2011, the loss in landings due to the reduced ACL is estimated to cause a loss in gross revenue of $142,102. The loss in gross revenue would be greater if the lower ACL causes the cancelation of trips targeting gag and the loss of all gross revenue from species harvested on those trips. Since the losses associated with the potential cancelation of those trips cannot be estimated with currently available data, the net gain in gross revenue under **Preferred Alternative 3** relative to **Alternative 1 (No Action)** is $121,741.

1.4.4 Economic Impacts

By increasing the commercial ACL for yellowtail snapper, modifying the AM for gag, and reducing the ACL for gag, the combination of Action 1 and Action 3 is expected to increase annual gross revenue by $1,417,877, assuming the commercial ACLs for yellowtail snapper and gag are fully harvested. This increase in gross revenue will in turn generate economic impacts for seafood dealers, restaurants, and other onshore businesses. The estimated economic impacts are presented in **Table H-1** below. According to the information in this table, the expected increase in annual gross revenue is expected to increase employment, income, and output by 267 jobs, $7.96 million, and $18.67 million, respectively.

Table H-1. Summary of Commercial Economic Impacts

Industry Sector	Direct	Indirect	Induced	Total
Harvesters				
Employment impacts (FTE jobs)	23	3	10	35
Income Impacts (000 of dollars)	575	158	437	1,169
Output Impacts (000 of dollars)	1,055	573	1,411	3,039
Primary dealers/processors		25,527		
Employment impacts (FTE jobs)	8	2	11	21
Income Impacts (000 of dollars)	373	128	482	983
Output Impacts (000 of dollars)	1,058	443	1,557	3,059
Secondary wholesalers/distributors	1,873	45,416		
Employment impacts (FTE jobs)	8	2	8	18
Income Impacts (000 of dollars)	519	87	356	962
Output Impacts (000 of dollars)	821	284	1,151	2,256
Grocers	1,305	62,540		
Employment impacts (FTE jobs)	7	0	3	11
Income Impacts (000 of dollars)	224	25	151	400
Output Impacts (000 of dollars)	306	77	488	871
Restaurants	1,220	32,596		
Employment impacts (FTE jobs)	140	4	38	182
Income Impacts (000 of dollars)	2,516	227	1,698	4,441
Output Impacts (000 of dollars)	3,291	676	5,476	9,443
Harvesters and seafood industry	5,101	17,980		
Employment impacts (FTE jobs)	186	11	70	267
Income Impacts (000 of dollars)	4,206	625	3,125	7,956
Output Impacts (000 of dollars)	6,530	2,054	10,084	18,668

Economic impacts are not expected to result in the short-run from the increased recreational ACL for yellowtail snapper under Action 1 as the recreational sector's recent landings have been significantly below the current ACL. Further, even if recreational landings did increase in response to the higher ACL, additional economic impacts from the recreational sector would be due to an increase in the number of trips. Currently, insufficient information exists to estimate the potential increase in trips and thus the potential economic impacts.

1.5 Public and Private Costs of Regulations

The preparation, implementation, enforcement, and monitoring of this or any federal action involves the expenditure of public and private resources that can be expressed as costs associated with the regulations. Costs associated with this specific action would include:

Council costs of document preparation, meetings, public hearings, and information dissemination……..$35,000

NMFS administrative costs of document preparation, meetings, and review…….....$20,000

TOTAL……....$55,000

The Council and Federal costs of document preparation are based on staff time, travel, printing, and any other relevant items where funds were expended directly for this specific action.

1.6 Determination of Significant Regulatory Action

Pursuant to E.O. 12866, a regulation is considered a "significant regulatory action" if it is likely to result in: 1) An annual effect of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities; 2) create a serious inconsistency or otherwise interfere with an action taken or planned by another agency; 3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights or obligations of recipients thereof; or 4) raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this executive order. Based on the information provided above, this action has been determined to not be economically significant for purposes of E.O. 12866.

APPENDIX I

1.0 REGULATORY FLEXIBILITY ACT ANALYSIS

1.1 Introduction

The purpose of the Regulatory Flexibility Act (RFA) is to establish a principle of regulatory issuance that agencies shall endeavor, consistent with the objectives of the rule and of applicable statutes, to fit regulatory and informational requirements to the scale of businesses, organizations, and governmental jurisdictions subject to regulation. To achieve this principle, agencies are required to solicit and consider flexible regulatory proposals and to explain the rationale for their actions to assure such proposals are given serious consideration. The RFA does not contain any decision criteria; instead the purpose of the RFA is to inform the agency, as well as the public, of the expected economic impacts of various alternatives contained in the FMP or amendment (including framework management measures and other regulatory actions) and to ensure the agency considers alternatives that minimize the expected impacts while meeting the goals and objectives of the FMP and applicable statutes.

With certain exceptions, the RFA requires agencies to conduct an initial regulatory flexibility analysis (IRFA) for each proposed rule. The IRFA is designed to assess the impacts various regulatory alternatives would have on small entities, including small businesses, and to determine ways to minimize those impacts. An IRFA is conducted to primarily determine whether the proposed action would have a "significant economic impact on a substantial number of small entities." In addition to analyses conducted for the RIR, the IRFA provides: 1) a description of the reasons why action by the agency is being considered; 2) a succinct statement of the objectives of, and legal basis for, the proposed rule; 3) a description and, where feasible, an estimate of the number of small entities to which the proposed rule will apply; 4) a description of the projected reporting, record-keeping, and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirements of the report or record; 5) an identification, to the extent practicable, of all relevant federal rules, which may duplicate, overlap, or conflict with the proposed rule; and (6) a description of any significant alternatives to the proposed rule which accomplish the stated objectives of applicable statutes and which minimize any significant economic impact of the proposed rule on small entities.

In addition to the information provided in this section, additional information on the expected economic impacts of the proposed action is included in **Chapter 4** and **Appendix H**.

1.2 Statement of the need for, objectives of, and legal basis for the rule

A discussion of the reasons why action by the agency is being considered is provided in **Section 1.4** of this document. In summary, the purposes of this proposed rule are to modify the existing specification of optimum yield (OY) and annual catch limit (ACL)

for yellowtail snapper in the South Atlantic and modify the existing gag commercial ACL and accountability measure for gag that requires a closure of all other shallow water groupers (SWG) in the South Atlantic when the gag commercial ACL is met or projected to be met. The objectives of this proposed rule are to ensure yellowtail snapper ACLs are based on the best available science regarding stock status of this species in the South Atlantic; enhance socioeconomic benefits to fishermen and fishing communities that utilize the yellowtail snapper component of the snapper grouper fishery; and reduce adverse socioeconomic effects to fishermen and fishing communities that utilize the shallow water grouper component of the snapper grouper fishery. The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) serves as the legal basis for the proposed rule.

1.3 Description and estimate of the number of small entities to which the proposed action would apply

This proposed rule is expected to directly affect commercial fishing vessels that possess commercial snapper grouper permits and for-hire vessels that possess for-hire snapper grouper permits for the South Atlantic. The Small Business Administration has established size criteria for all major industry sectors in the U.S. including fish harvesters. A business involved in fish harvesting is classified as a small business if it is independently owned and operated, is not dominant in its field of operation (including its affiliates), and has combined annual receipts not in excess of $4.0 million (NAICS code 114111, finfish fishing) for all its affiliated operations worldwide. For for-hire vessels, the other qualifiers apply and the receipts threshold is $7.0 million (NAICS code 713990, recreational industries).

In 2003-2007, the number of commercial snapper grouper permits averaged 944, of which 749 were transferable and 195 were non-transferable. Transferable permits have no harvest limit per trip, except for species subject to trip limits, while non-transferable permits are restricted to 225 pounds of harvest per trip. The comparable numbers for 2008-2010 were 788 total permits, of which 643 were transferable permits and 145 transferable permits. As of October 30, 2012, there were 690 vessels with commercial snapper grouper permits, of which 563 were transferable and 127 were non-transferable.

Any commercial vessel with a commercial snapper grouper permit may commercially harvest yellowtail snapper or shallow water grouper (SWG), including gag, in the South Atlantic. Average annual commercial landings of all snapper grouper species in the South Atlantic from 2003-2007 was approximately 6.43 million pounds with an ex-vessel value of approximately $14.98 million. For 2007-2011, landings averaged approximately 5.33 million pounds and were valued at $14.28 million in 2011 dollars. All landings (all trips and all species) by all vessels landing snapper grouper averaged approximately 11.24 million pounds valued at $24.74 million from 2003 through 2007. For 2007-2011, landings by these vessels averaged 12.21 million pounds and were valued at $24.35 million. During 2003-2007, an average of 890 commercial vessels per year harvested snapper grouper species and took an annual average of 14,665 trips. The corresponding figures for 2007-2011 are 865 vessels and 14,271 trips. Thus, for 2007 through 2011,

average annual gross revenue per vessel in the snapper grouper fishery was approximately $28,150. In 2011, the maximum annual gross revenue for a commercial snapper grouper vessel was $618,272.

The average annual yellowtail snapper commercial harvest in the South Atlantic over the 2007-2011 time period was approximately 895,145 pounds gutted weight (lb gw). More than 99% of commercially harvested yellowtail snapper are harvested off of and landed in Florida and are harvested using hook and line gear. The average ex-vessel price per pound for yellowtail snapper over this period was approximately $3.00. As a result, this harvest resulted in an average of approximately $2.67 million per year in gross revenue, ranging from a low of around $1.93 million in 2007 to a high of nearly $3.25 million in 2011 and thus trended upward during this time.

From 2007 through 2011, 639 vessels harvested South Atlantic yellowtail snapper in at least one of those years. However, only half or less of these vessels actually harvested yellowtail snapper in any given year. Thus, many vessels commonly enter and exit the yellowtail snapper component of the snapper grouper fishery's commercial sector from year to year. Further, many of these vessels are not active in commercial fishing every year as, on average, only 465 of these vessels (73%) showed any commercial fishing activity in the South Atlantic or Gulf of Mexico per year during this time. Thus, some of these vessels enter and exit commercial fisheries from year to year as well, suggesting they commercially fish on a part-time basis. On average, these vessels accounted for approximately $15.3 million in total gross revenue per year between 2007 and 2011. Average annual total gross revenue per vessel was approximately $32,949 during this time. Average annual gross revenue from yellowtail snapper was about $5,765, increasing from $4,093 to $7,317 between 2007 and 2011.

The average number of vessels commercially harvesting South Atlantic yellowtail snapper was 313 during this time period, but trended downward from around 335 between 2007 and 2009 to 266 vessels in 2011. On a per vessel basis, average annual gross revenue from harvests of yellowtail snapper on trips harvesting yellowtail snapper was about $8,707 during this time, ranging from a low of $5,767 in 2007 to a high of $12,213 in 2011. Total gross revenue from all species on these trips averaged $11,619 per vessel between 2007 and 2011, increasing from $8,226 in 2007 to $15,340 in 2011.

Vessels harvesting South Atlantic yellowtail snapper also take trips on which no South Atlantic yellowtail snapper is harvested. The landings and revenue associated with these trips constitute a substantial amount of the gross revenue for these vessels. Although harvests of South Atlantic yellowtail snapper account for the vast majority of revenue on trips that harvest yellowtail snapper, they represent only about 27.3% of these vessels' total annual gross revenue on average. From 2007 through 2011, these vessels became more dependent on revenue from coastal migratory pelagic species (e.g., king mackerel) and less dependent on revenue from shallow water grouper species (e.g., gag).

The average annual SWG commercial harvest in the South Atlantic over the period 2007-2011 was approximately 1.098 million pounds gutted weight (lb gw), but has

trended downward since 2007. Most SWG were landed in North Carolina (41%), South Carolina (39%), and East Florida (14%) between 2007 and 2011 and the vast majority (88%) are harvested using hook and line gear. The average ex-vessel price per pound for SWG over this period was approximately $4.37, but increased to $5.14 per pound in 2011. As a result, this harvest resulted in an average of approximately $4.8 million per year in gross revenue, ranging from a high of around $6.54 million in 2007 to a low of about $3.93 million in 2010 and 2011. Thus, the trend is generally downward, with annual gross revenue decreasing by approximately 40% during this time.

The average number of vessels harvesting South Atlantic SWG was 468 from 2007 through 2011. However, the number of vessels declined from a high of 542 in 2007 to a low of 381 in 2011, with the biggest decline occurring in 2010 primarily due to the prohibition on commercial harvest of red snapper and the abbreviated commercial season for vermilion snapper. On a per vessel basis, average annual gross revenue from harvests of SWG on trips harvesting SWG was about $10,236 during this time, ranging from a high of $12,072 in 2007 to a low of $9,034 in 2009, but increasing somewhat in 2010 and 2011 due to the decline in number of vessels and increase in the average price of SWG. Total gross revenue from all species on these trips averaged about $22,000 per vessel between 2007 and 2011, decreasing from $24,540 in 2007 to $19,539 in 2010, but increasing in 2011 to $21,816.

The average annual gag commercial harvest in the South Atlantic over the period 2007-2011 was approximately 405,254 pounds gutted weight (lb gw). Landings ranged from a high of 515,834 lb gw in 2007 to a low of 365,768 lb gw in 2011. Most gag were landed in South Carolina (36%), North Carolina (33%), and East Florida (29%) between 2007 and 2011 and the vast majority (76%) are harvested using hook and line gear. The average ex-vessel price per pound for gag over this period was approximately $4.77, although it increased to $5.42 per pound in 2011. As a result, this harvest resulted in an average of approximately $1.93 million per year in gross revenue, ranging from a high of around $2.39 million in 2007 to a low of about $1.73 million in 2010. Again, the trend is generally downward during this time.

The average number of vessels harvesting South Atlantic gag was 273 from 2007 through 2011. However, the number of vessels harvesting gag trended downwards during this time, declining from a high of 306 in 2007 to a low of 231 in 2011. On a per vessel basis, average annual gross revenue from gag on trips harvesting gag was about $7,130 during this time, ranging from a low of $5,960 in 2009 to a high of $8,580 in 2011. Although gag gross revenue per trip declined by 24% from 2007 to 2009, it subsequently increased by 44% between 2009 and 2011. Gross revenue from all species on these trips averaged $24,173 per vessel between 2007 and 2011, decreasing from $25,880 in 2007 to $21,954 in 2009, but increasing to $26,272 in 2011.

Given the information above on the SWG and gag components of the snapper grouper fishery's commercial sector, and further noting that gag is part of the SWG complex, it is clear these components of the fishery have been noticeably if not highly unstable from 2007 to 2011. In addition to the red and vermilion snapper closures in 2010, a deep water

grouper (DWG) area closure was implemented in 2011, then subsequently eliminated in 2012, the spawning season closure for gag was extended in 2010 from March-April to January-April, and a 1,000 lb trip limit was implemented in mid-2011. Economic and market factors also appear to have played a role, particularly with respect to changes in the price of SWG and gag in 2011. Thus, as of 2011, these components of the fishery bear little resemblance to what they were in 2007-2009, while 2010 appears to have been a transition year during which many of these changes occurred or were just starting to take effect and vessel owners were adjusting to those changes. As such, in terms of vessel behavior and the outcomes of that behavior (e.g., vessel participation, landings, gross revenue, etc.), information for years prior to 2011 is probably irrelevant with respect to evaluating the expected effects of additional management measures. Thus, the following description of vessels' gross revenue portfolios for the commercial South Atlantic SWG and gag components of the snapper grouper fishery only examines information from 2011.

Vessels harvesting South Atlantic SWG also take trips on which no South Atlantic SWG are harvested. The landings and gross revenue associated with these trips constitute a substantial amount of the gross revenue for these vessels. Although harvests of South Atlantic SWG accounted for about 47% of the gross revenue on trips that harvested South Atlantic SWG in 2011, they represented only 26% of these vessels' total annual gross revenue. These vessels are also relatively dependent on gross revenue from shallow water snapper (e.g., lane snapper), coastal migratory pelagics, mid-depth snapper (e.g., vermilion snapper), and jacks, which account for approximately 23%, 18%, 10%, and 7% of their total annual gross revenue, with grunts/porgies (3%) and other species (12%) accounting for the rest of their gross revenue, respectively. This information indicates that South Atlantic SWG vessels' operations are not only multi-species in nature, but multi-fishery in nature as well. These results are not intended to suggest that none of these vessels are highly dependent on gross revenue from South Atlantic SWG. However, gross revenue from South Atlantic SWG harvests represented 50% or more of total annual gross revenue for only 78 of the 381 vessels that harvested SWG in 2011. These 381 vessels accounted for approximately $16.7 million in gross revenue in 2011, of which about $3.93 million came from landings of SWG. Thus, average annual gross revenue in 2011 for vessels harvesting SWG was approximately $43,830, with SWG accounting for about $10,314 of that revenue.

Similarly, vessels harvesting South Atlantic gag also take trips on which no South Atlantic gag are harvested. The landings and gross revenue associated with these trips constitute a substantial amount of the gross revenue for these vessels. Although harvests of South Atlantic gag account for about one third of the gross revenue on trips that harvest South Atlantic gag, they represented only about 21% of these vessels' total annual gross revenue on average. These vessels are also relatively dependent on gross revenue from coastal migratory pelagics, other shallow water grouper, shallow water snapper, jacks, and mid-depth snapper which account for approximately 18%, 14%, 14%, 8%, and 6% of their total annual gross revenue, with other species accounting for the other 20%. Thus, South Atlantic gag vessels' operations are not only multi-species in nature, but multi-fishery in nature as well. These results are not intended to suggest that

none of these vessels are highly dependent on gross revenue from South Atlantic gag. However, gross revenue from South Atlantic gag harvests represented 50% or more of total annual gross revenue for only 27 of the 231 vessels that harvested gag in 2011. These 231 vessels accounted for approximately $11.91 million in gross revenue in 2011, of which about $1.98 million came from landings of SWG. Thus, average annual gross revenue in 2011 for vessels harvesting gag was approximately $51,560, with gag accounting for about $8,570 of that revenue.

From 2003 through 2008, the average of number of snapper grouper for-hire permits in the South Atlantic was 1,811. In 2009-2010, the number of South Atlantic snapper grouper for-hire permits averaged 1,953. As of July 9, 2012, the number of for-hire vessels with South Atlantic for-hire snapper grouper permits was 1,524. Florida is the homeport state for most of these vessels. For-hire permits do not distinguish charterboats from headboats and thus the specific number of charterboats and headboats with for-hire snapper-grouper permits cannot be estimated. The number of for-hire vessels that landed snapper grouper in general or yellowtail snapper specifically during this time period also cannot be estimated based on currently available data.

Any for-hire vessel with a for-hire snapper grouper permit may recreationally harvest snapper grouper in general or yellowtail snapper specifically in the South Atlantic. Recreational snapper grouper landings in the South Atlantic averaged approximately 10.8 million pounds per year during 2005-2009. Private boat anglers accounted for the largest landings, accounting for approximately 6.1 million pounds, followed by shore anglers (1.7 million pounds), charter vessels (1.6 million pounds), and headboat vessels (1.4 million pounds). In 2010-2011, recreational snapper grouper landings averaged approximately 11.8 million pounds annually, with 6.7 million pounds contributed by private vessels, 2.7 million pounds by shore anglers, 1.2 million pounds by charter vessels, and 1.2 million pounds by headboats.

As in the commercial sector, more than 99% of yellowtail snapper recreationally harvested in the South Atlantic occurred in waters off Florida. In the aggregate, recreational yellowtail snapper landings averaged 541,301 pounds (ww) between 2007 and 2011, but have generally been trending downward, decreasing by 53% in 2009 before increasing and then decreasing again in 2010 and 2011.

Recreational landings of yellowtail snapper also varied across the various fishing modes during 2007-2011. Charterboat landings followed the same pattern as total recreational landings and accounted for about 24% of total recreational landings. Headboat landings accounted for about 15% of total recreational landings and were far more stable during this time, but also decreased in 2009. The private/rental mode was by far the dominant sector with respect to landings of yellowtail snapper, accounting for approximately 60% of the total recreational landings. As such, private/rental landings basically followed the same pattern as total recreational landings from 2007 to 2011. Finally, the shore mode is relatively unimportant, accounting for only 1% of total recreational yellowtail snapper landings during this time.

From 2005 through 2009, an average of approximately 945,000 individual angler trips per year targeted snapper grouper species across all modes and states in the South Atlantic, or approximately 4% of all recreational trips. Snapper grouper target effort was highest in Florida, at approximately 694,000 trips per year, and in the private mode, approximately 626,000 trips per year. In 2010-2011, total angler target trips for snapper grouper dropped to about 826,000 per year. This still comprised about 4% of all recreational trips. Florida accounted for the highest number of target trips at about 579,000 trips and the private mode accounted for the highest number of target trips at 592,000 trips. For the most recent five years (2007-2011), total target effort for snapper grouper in the South Atlantic averaged 906,106 trips annually.

Substantially more recreational trips catch snapper grouper species than target these species. From 2003-2008, an average of approximately 3.5 million recreational trips caught snapper grouper each year. Over 80% if these trips occurred off Florida. In 2009-2011, this figure decreased to an average of about 2.8 million recreational trips, with about 76% occurring off Florida. Thus, the average catch effort for 2007 through 2011 is 3.3 million recreational trips per year.

For yellowtail snapper, the private/rental mode is by far the dominant sector in terms of catch and target trips, with charter vessels only accounting for about 11% and 3% of catch trips and target trips on average from 2007 through 2011, respectively. In addition, from 2007 through 2011, a substantial difference exists between the number of target and catch trips for yellowtail snapper, with target trips being generally less than 20% of catch trips. Thus, while 19,449 trips recorded landings of yellowtail snapper on average during this time, only 862 trips recorded this species as the target species on average. Like recreational landings, more than 99% of catch trips occur in waters off Florida while all target trips occur in waters off Florida.

Headboat effort cannot be attributed to specific species using available data. However, the stationary bottom nature of headboat fishing, as opposed to trolling, suggests that most headboat trips and, hence, angler days, are snapper grouper trips by intent. From 2005 to 2009, an average of approximately 225,000 headboat trips were taken each year in the South Atlantic. The majority of these trips, approximately 153,000 per year, were taken in Florida and Georgia. In 2010-2011, the number of headboat trips increased to 188,000 on average, with Florida and Georgia accounting for about 144,000 of those trips.

For-hire vessels receive value from the services they provide. Producer surplus is the measure of the economic value these operations receive. Producer surplus is the difference between the gross revenue a business receives for a good or service, such as a charter or headboat trip, and the cost the business incurs to provide that good or service. Estimates of the producer surplus associated with snapper grouper or yellowtail snapper for-hire trips are not available. However, proxy values in the form of net operating revenue (NOR) are available. NOR for charter vessels is estimated to be $132 (2011 dollars) per charter trip. Since NOR from the harvest of a particular species is only attributed to trips targeting that species, NOR per year from trips targeting yellowtail

snapper is estimated to have been approximately $113,800 on average for charter vessels between 2007 and 2011. Holland et al. (2012) reported that charter vessels in the South Atlantic had average gross revenues of approximately $106,000 per vessel in 2009, or approximately $109,700 in 2011 dollars. Holland et al. (2012) also report that, in 2009, no charter vessels earned more than $500,000 in gross revenues.

Net operating revenue per angler trip is lower for headboats than for charterboats. Net operating revenue estimates for a representative headboat trip are $48 in the Gulf of Mexico, including all of Florida, and $63-$68 in North Carolina. For full-day and overnight headboat trips, net operating revenue is estimated to be $74-$77 in North Carolina. These estimates are in 2009 dollars and comparable estimates are not available for Georgia and South Carolina. Based on this information, net operating revenue per headboat angler trip is estimated to be $68 (2009 dollars), or approximately $70 in 2011 dollars. Since target effort by headboat vessels cannot be estimated for specific species, NOR from trips targeting yellowtail snapper cannot be estimated for headboat vessels. Holland et al. (2012) reported that headboats in the South Atlantic had average gross revenues of approximately $188,000 per vessel in 2009, or approximately $194,570 in 2011 dollars.

Based on the figures above, all commercial fishing vessels expected to be directly affected by this proposed rule are determined for the purpose of this analysis to be small business entities. Similarly, based on these figures, all for-hire fishing vessels expected to be directly affected by this proposed rule are determined for the purpose of this analysis to be small business entities.

1.4 Description of the projected reporting, record-keeping and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirement and the type of professional skills necessary for the preparation of the report or records

This proposed action would not establish any new reporting, record-keeping, or other compliance requirements.

1.5 Identification of all relevant federal rules, which may duplicate, overlap or conflict with the proposed rule

No duplicative, overlapping, or conflicting federal rules have been identified.

1.6 Significance of economic impacts on small entities

<u>Substantial number criterion</u>

This proposed rule, if implemented, would be expected to directly affect all federally permitted commercial fishing entities and for-hire fishing entities in the South Atlantic snapper grouper fishery. All affected entities have been determined, for the purpose of

this analysis, to be small entities. Therefore, it is determined that the proposed rule will affect a substantial number of small entities.

Significant economic impacts

The outcome of "significant economic impact" can be ascertained by examining two factors: disproportionality and profitability.

Disproportionality: Do the regulations place a substantial number of small entities at a significant competitive disadvantage to large entities?

All entities expected to be directly affected by the measures in this proposed rule are determined for the purpose of this analysis to be small business entities, so the issue of disproportionality does not arise in the present case.

Profitability: Do the regulations significantly reduce profits for a substantial number of small entities?

For the action to revise the ACL and optimum yield for yellowtail snapper**,** the commercial yellowtail snapper ACL would increase from 1,142,657 pounds whole weight (lb ww) to 1,596,510 lb ww and the recreational yellowtail snapper ACL would increase from 1,031,286 lb ww to 1,440,990 lb ww. Since commercial landings have been trending upward and the 2011 landings were basically equivalent to the 2012 commercial ACL, commercial vessels are expected to take full advantage of any increase in the commercial ACL. Thus, the increase in the commercial ACL is expected to result in an increase in gross revenue of approximately $1.3 million for the commercial sector.

Although 639 vessels had some landings of yellowtail snapper between 2007 and 2011, on average, only 465 of these vessels were active in commercial fishing in a given year. Increases in gross revenue would only be expected to accrue to vessels actively engaged in commercial fishing. Thus, the expected increase in gross revenue per vessel is expected to be approximately $2,790. Given that average annual gross revenue is $32,949 for these vessels, this change represents an increase of approximately 8.5% in annual gross revenue per vessel on average. The expected increase in gross revenue may also yield an equivalent increase in profit if vessels can increase their landings of yellowtail snapper without increasing their effort, and thereby costs, which is possible given that vessels were able to achieve about the same level of landings in 2011 as in 2009 but with approximately 16% less effort. In addition, even if vessels increase their effort and costs do increase, it is likely that gross revenue from other species will also increase, at least to some extent. However, these increases may not be proportional to the increase in yellowtail snapper gross revenue as ACLs for these other species (e.g., gag, vermilion snapper, etc.) may restrict harvest increases.

With respect to the increase in the recreational ACL, the expected effect on NOR for for-hire vessels is not as certain. Since the for-hire and private recreational sectors do not have separate allocations, it is unknown how potential changes in the recreational ACL

and recreational landings and would be allocated between the for-hire and private recreational sectors. Thus, changes in NOR for the for-hire sector cannot be estimated. Further, annual recreational landings of yellowtail snapper were 541,301 lb (ww) on average from 2007 through 2011, trended downward during this time, and were only 390,998 lb (ww) in 2011. Thus, average and 2011 recreational landings are less than the current recreational ACL and substantially less than the proposed recreational ACL. As such, the current recreational ACL is not constraining harvest in the for-hire sector at the present time and likely will not constrain it in the near future. However, if landings in the recreational sector increase in the future, and those increases allow the for-hire sector to increase its harvests beyond what would have otherwise occurred without the increase in the ACL, then NOR in the for-hire sector would be expected to increase as a result. Thus, although increases in NOR in the for-hire sector are not expected in the short-term, increases may occur in the long-term.

For the action to change the commercial AM and ACL for gag, the AM would change from prohibiting commercial harvest of all SWG when the gag commercial ACL has been or is projected to be met to only prohibiting the commercial harvest of gag when the gag commercial ACL has been or is projected to be met. In 2012, the commercial ACL for gag was projected to be met on October 19 and a prohibition on commercial harvest of SWG went into effect on October 20. The total loss in annual gross revenue as a result of this prohibition is estimated to be $1,239,950. For the proposed AM, it is assumed trips targeting SWG that were canceled under the current AM would have occurred unless they targeted gag. That is, trips targeting gag would still be canceled under the proposed AM. Based on the most currently available data, it is estimated there were 336 trips that targeted gag after the prohibition went into effect. The gross revenue from all species on those trips was $901,544. In addition, landings of gag from trips targeting species other than gag and SWG would also not be retained under the proposed AM. These landings accounted for an additional $74,563 in gross revenue. Thus, the loss in annual gross revenue from the cancelation of trips targeting SWG other than gag and the loss of gag landings from other trips due to a closure for gag is estimated to be $976,107. As a result, the annual loss in gross revenue under the proposed AM is estimated to be $263,843 less than under current AM, which in effect represents a gain in annual gross revenue of $263,843.

However, the proposed action would also reduce the gag commercial ACL from 352,940 lb gw to 326,722 lb gw. A lower commercial ACL would be expected to cause an earlier closure of gag than under current commercial ACL. It is not possible to accurately predict how much earlier that closure would occur based on currently available data. Thus, a simpler approach to estimating the loss in gross revenue due to the reduced ACL is employed. Specifically, the difference between the current and proposed commercial ACL is 26,218 lb gw. Given an average price of $5.42/lb for gag in 2011, the loss in landings due to the reduced ACL is estimated to cause a loss in annual gross revenue of $142,102. The loss in annual gross revenue would be greater if the lower ACL causes the cancelation of trips targeting gag and the loss of all gross revenue from species harvested on those trips. Since the losses associated with the potential

cancelation of those trips cannot be estimated with currently available data, the net gain in gross revenue under the proposed action is $121,741.

Because the 231 vessels that harvested gag in 2011 are a subset of the 381 vessels that harvested SWG in 2011, it is assumed this gain in annual gross revenue will accrue to the 381 vessels that harvested SWG. Thus, the increase in annual gross revenue per vessel under the proposed action to change the commercial gag AM and ACL is estimated to be approximately $320 which, given an average annual gross revenue of $43,830 per vessel, represents an increase of about 1% in annual gross revenue per vessel on average.

As a result of the information above, no reduction in profits for a substantial number of small entities would be expected.

1.7 Description of significant alternatives to the proposed action and discussion of how the alternatives attempt to minimize economic impacts on small entities

This proposed action, if implemented, would not be expected to have a significant direct adverse economic effect on the profits of a substantial number of small entities. As a result, the issue of significant alternatives is not relevant.