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

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

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

B_{CURR} the current stock biomass

CPUE catch per unit effort

DEIS draft environmental impact statement

EA environmental assessment

EEZ exclusive economic zone

EFH essential fish habitat

F a measure of the instantaneous rate of fishing mortality

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

F_{CURR} the current instantaneous rate of fishing mortality

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

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

FEIS final environmental impact statement

FMP fishery management plan

FMU fishery management unit

M natural mortality rate

MARMAP Marine Resources Monitoring Assessment and Prediction Program

MFMT maximum fishing mortality threshold

MMPA Marine Mammal Protection Act

MRFSS Marine Recreational Fisheries Statistics Survey

MRIP Marine Recreational Information Program

MSFCMA Magnuson-Stevens Fishery Conservation and Management Act

MSST minimum stock size threshold

MSY maximum sustainable yield

NEPA National Environmental Policy Act

NMFS National Marine Fisheries Service

NOAA National Oceanic and Atmospheric Administration

OFL overfishing limit

OY optimum yield

RIR regulatory impact review

SAMFC South Atlantic Fishery Management Council

SEDAR Southeast Data, Assessment, and Review

SEFSC Southeast Fisheries Science Center

SERO Southeast Regional Office

SIA social impact assessment

SPR spawning potential ratio

SSC Scientific and Statistical Committee

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

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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 (including red hind, rock hind, yellowmouth grouper, yellowfin grouper, coney, and graysby), 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).

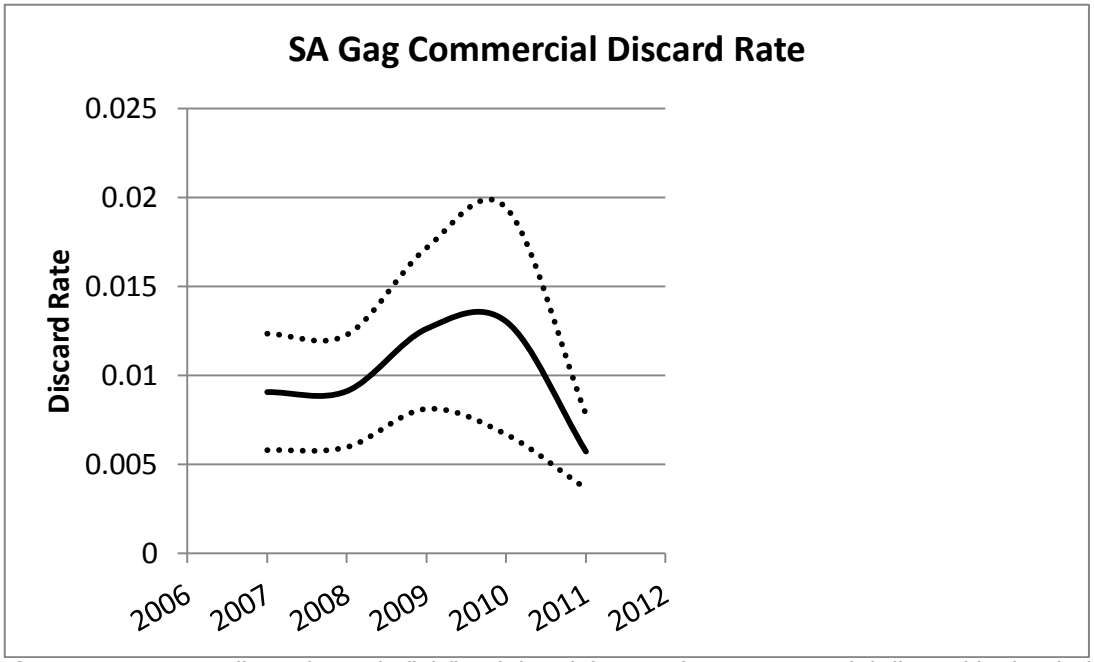

Figure S-1. Mean discard rate (# fish/hook hour) for gag from commercial discard logbook data. Source: NMFS SERO

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.

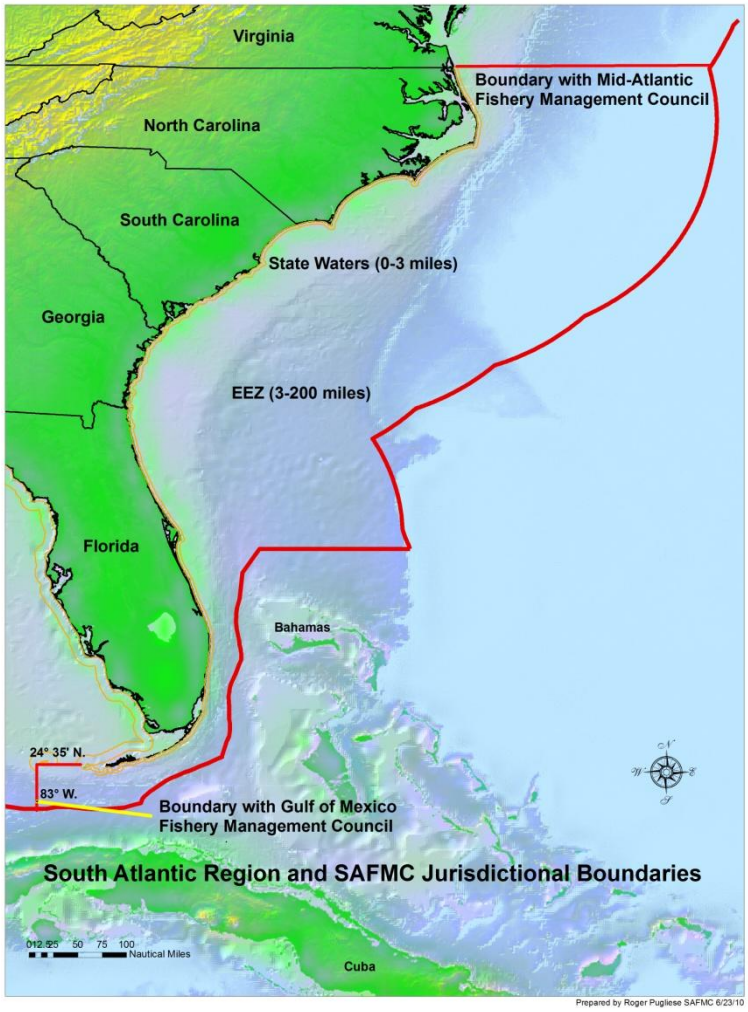

Figure 1.3.1. Jurisdictional boundaries of the South Atlantic Fishery Management Council.

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:

Yellowtail Snapper

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 (including red hind, rock hind, yellowmouth grouper, yellowfin grouper, coney, and graysby), 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.

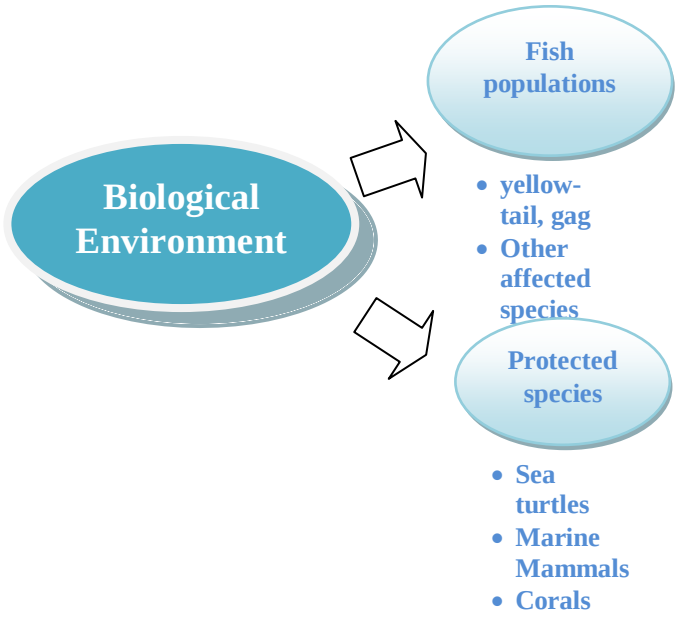

Figure 3.1.1. Two components of the biological environment described in this document.

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.

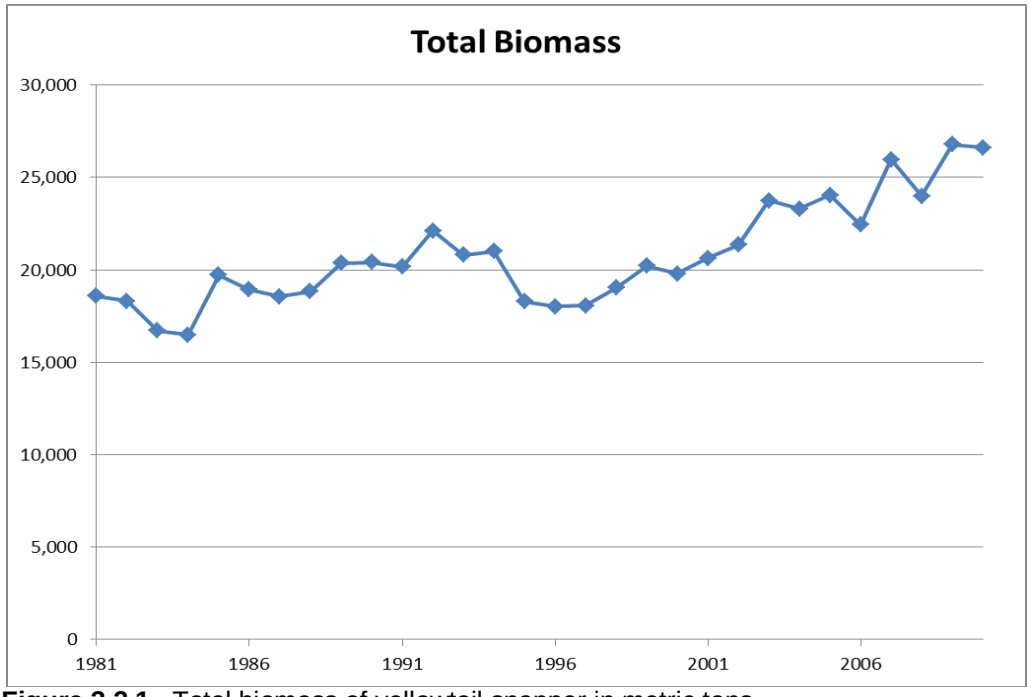

Figure 3.2.1. Total biomass of yellowtail snapper in metric tons.
Data are from the 2012 assessment report for yellowtail snapper, Florida Fish and Wildlife Conservation Commission.

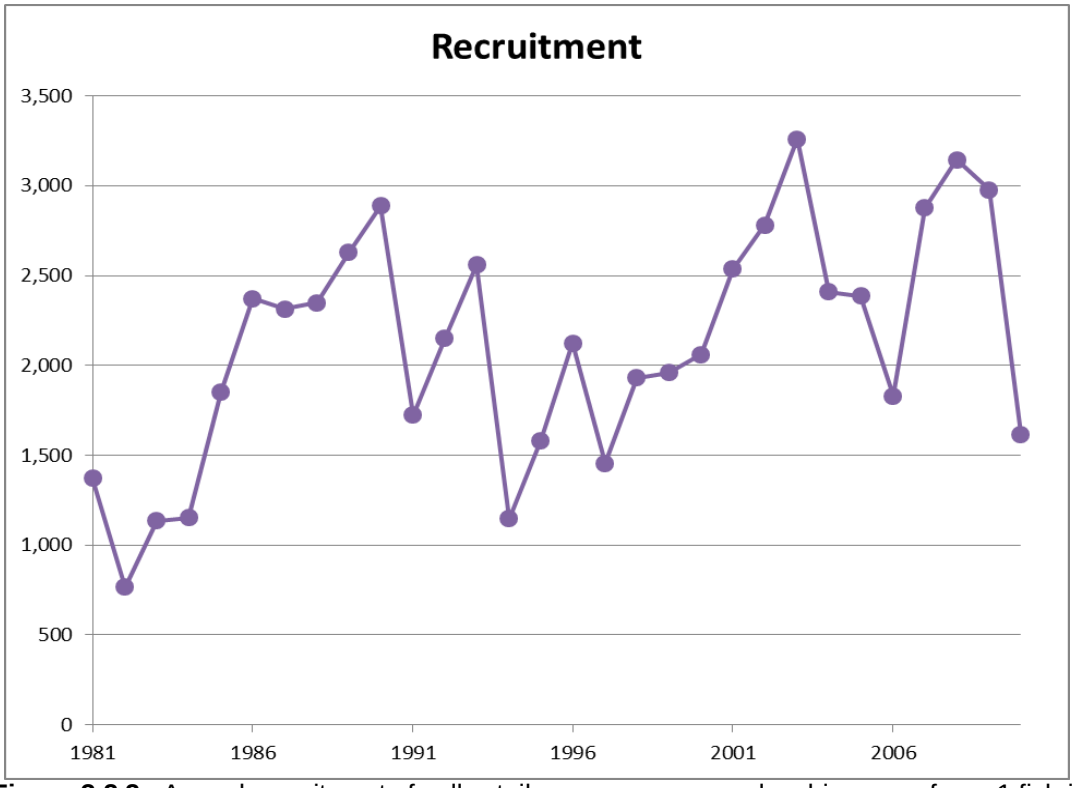

Figure 3.2.2. Annual recruitment of yellowtail snapper expressed as biomass of age 1 fish in metric tons. Data are from the 2012 assessment report for yellowtail snapper, Florida Fish and Wildlife Conservation Commission.

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.

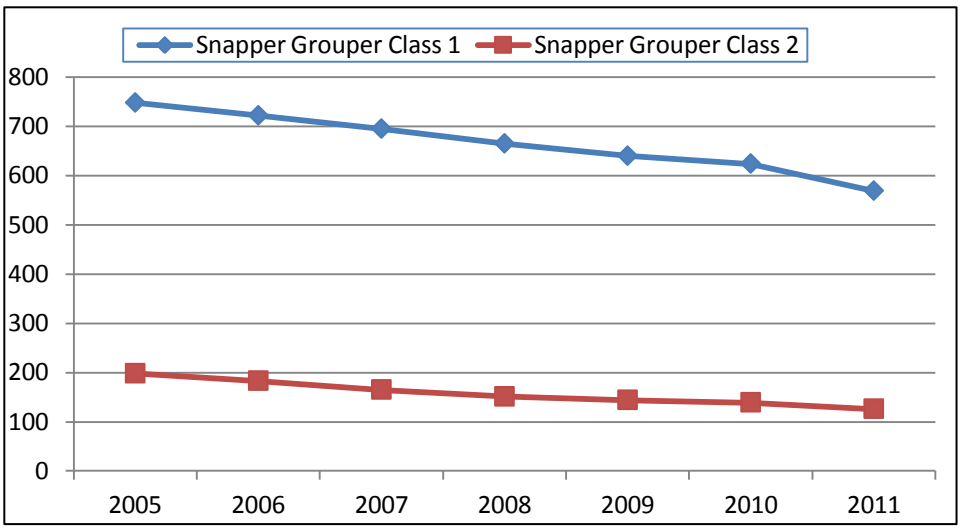

Figure 3.3.1. Snapper grouper class 1 (unlimited) and class 2 (225-Pound trip limit) permits 2005-2011. Source: Permits Database, NMFS SERO (2011).

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).

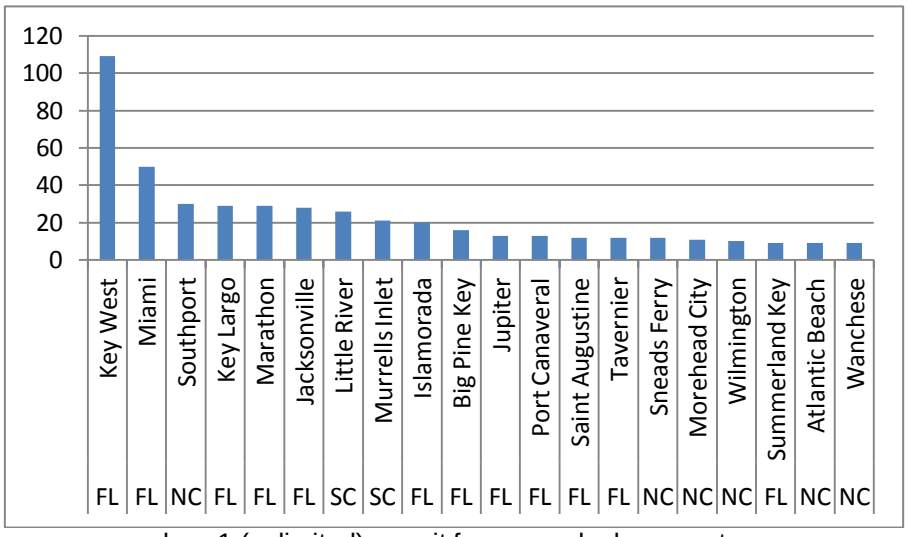

Figure 3.3.2. Snapper grouper class 1 (unlimited) permit frequency by homeport.
Source: Permits Database, NMFS SERO (2011).

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)**.

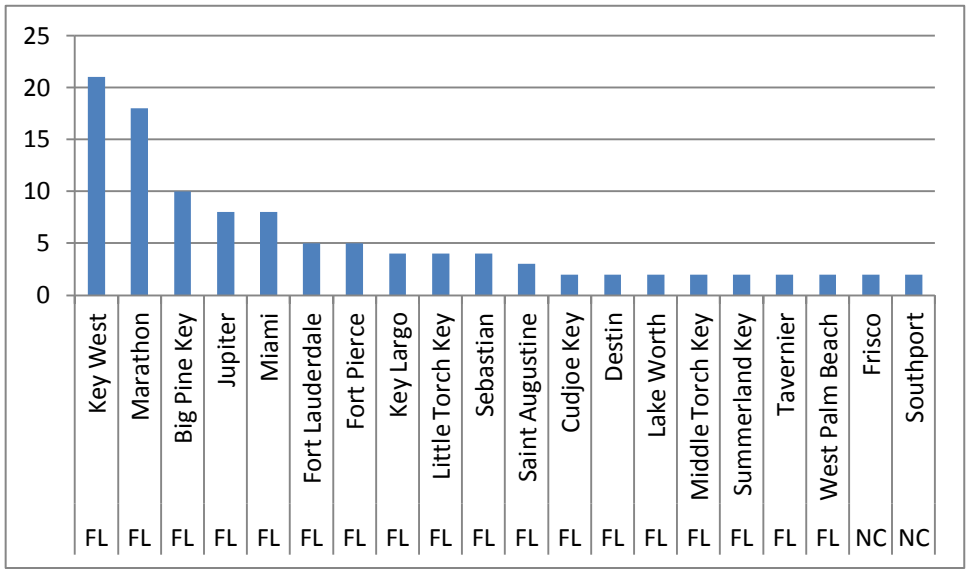

Figure 3.3.3. Snapper grouper class 2 (225-Pound trip limit) permits frequency by homeport
Source: Permits Database, NMFS SERO (2011).

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.

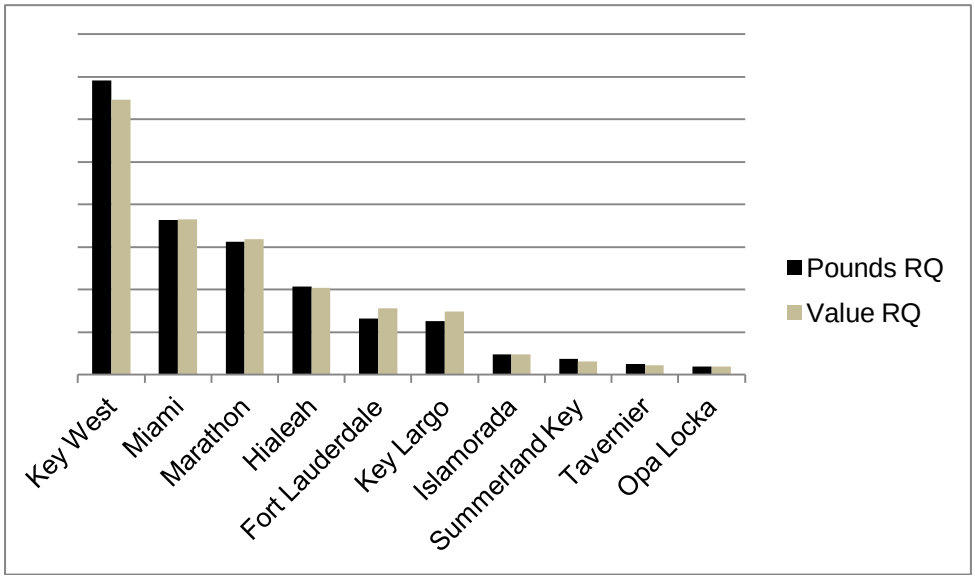

Figure 3.3.4. South Atlantic communities ranked by regional quotient of weight and value of yellowtail snapper landings
Source: Accumulative Landings System (2011).

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.

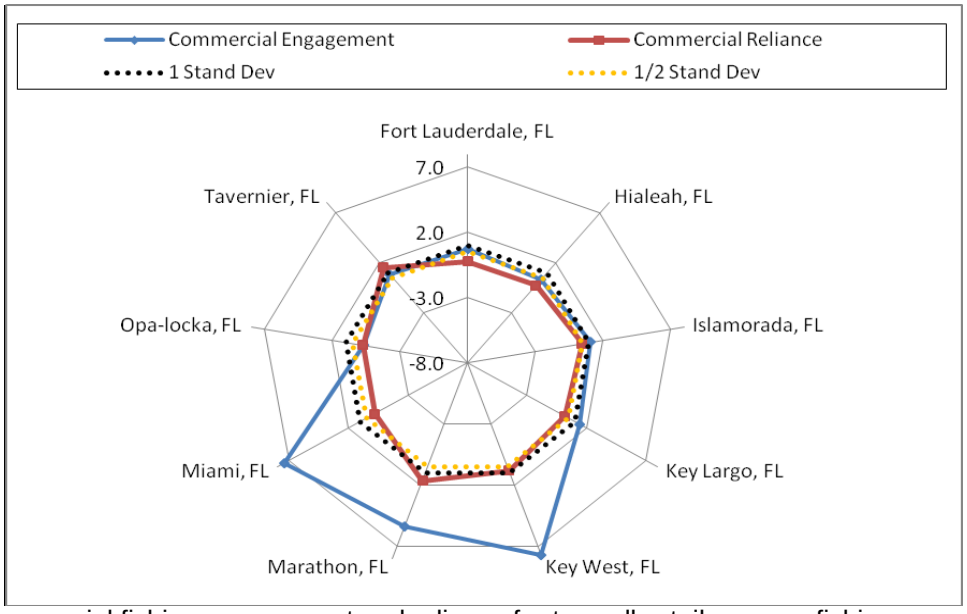

Figure 3.3.5. Commercial fishing engagement and reliance for top yellowtail snapper fishing communities
Source: Social Indicators Database NMFS SERO (2012).

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.

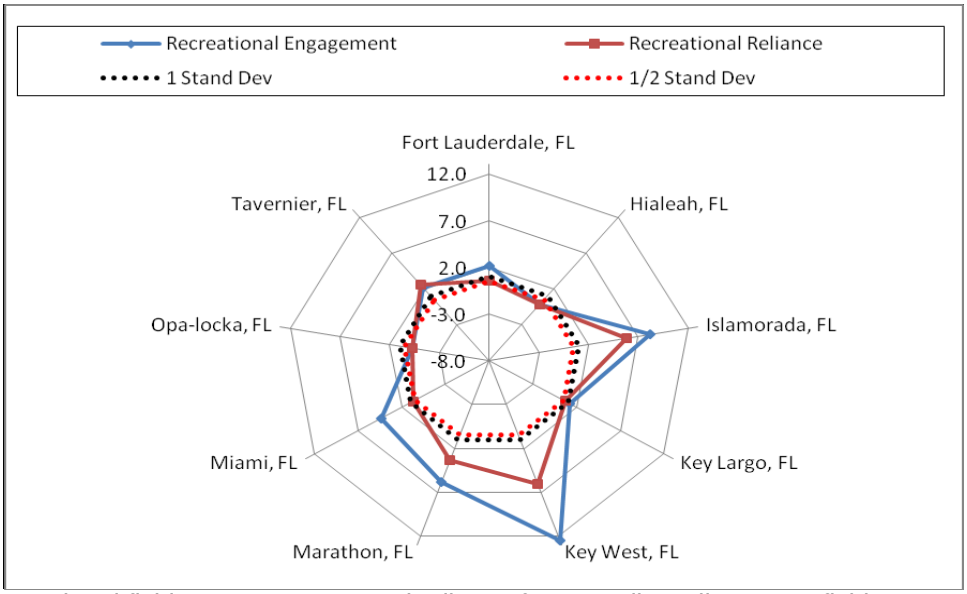

Figure 3.3.6. Recreational fishing engagement and reliance for top yellowtail snapper fishing communities
Source: Social Indicators Database NMFS SERO (2012)

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.

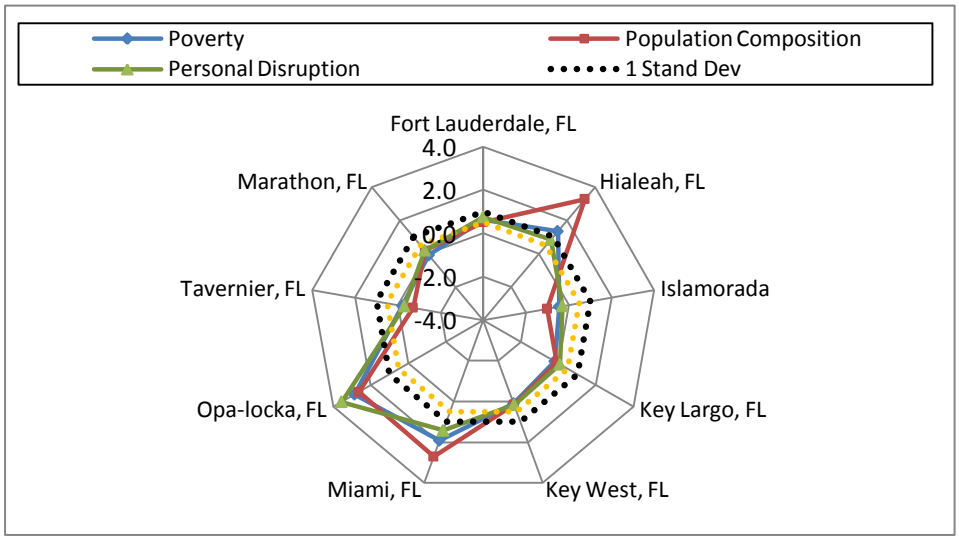

Figure 3.3.7. Social vulnerability indices for top yellowtail snapper fishing communities
Source: Social Indicators Database NMFS SERO (2012).

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.

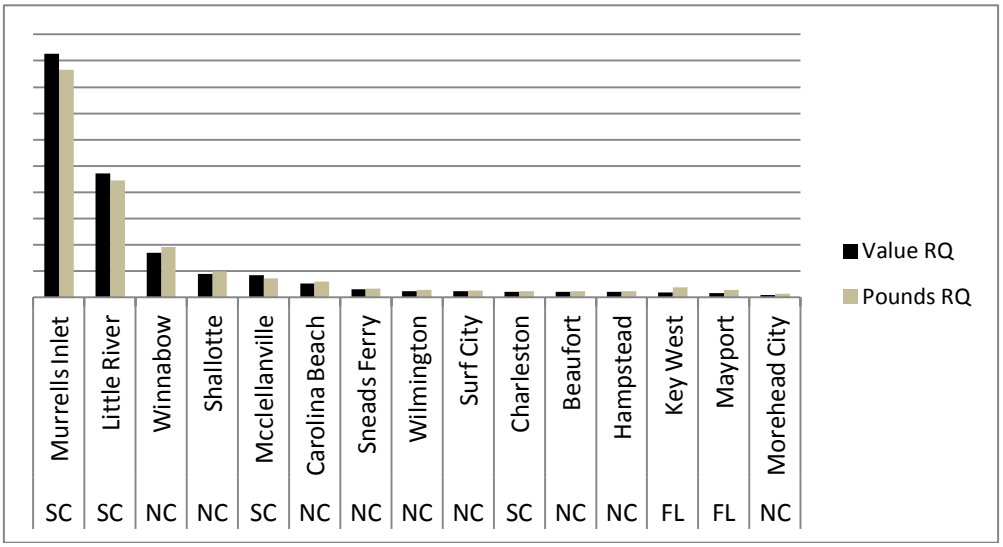

Figure 3.3.8. South Atlantic communities ranked by regional quotient of weight and value of shallow water grouper landings
Source: Accumulative Landings System (2011)

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.

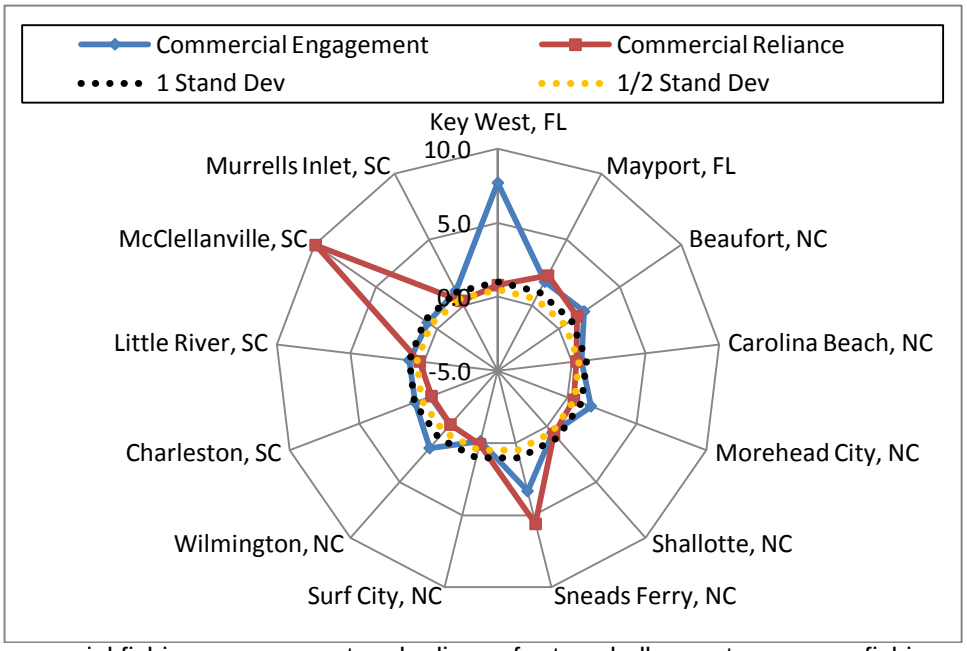

Figure 3.3.9. Commercial fishing engagement and reliance for top shallow water grouper fishing communities
Source: Social Indicators Database NMFS SERO (2012)

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.

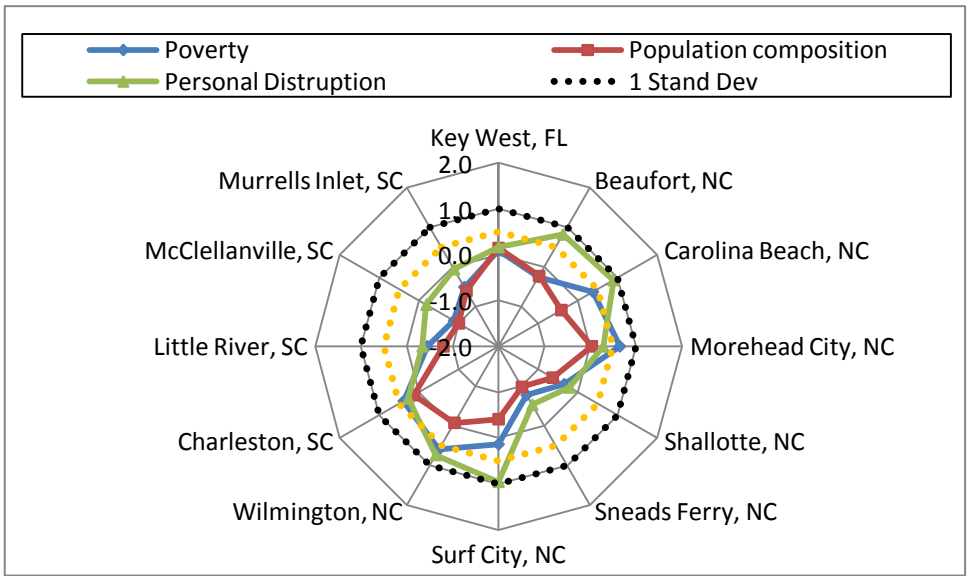

Figure 3.3.10. Social vulnerability indices for top shallow water grouper fishing communities
Source: Social Indicators Database NMFS SERO (2012)

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.

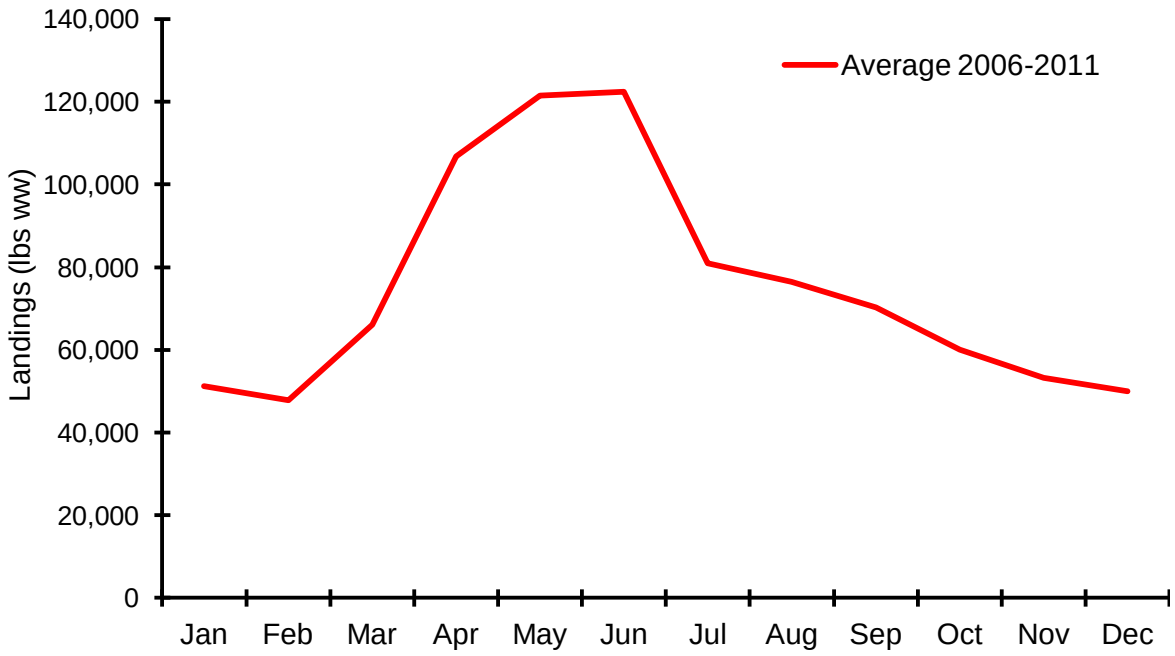

Figure 4.2.1. Average commercial landings of yellowtail snapper in the South Atlantic by month from 2006 through 2011.
Source: Commercial ACL dataset, NMFS Southeast Regional Office.

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.

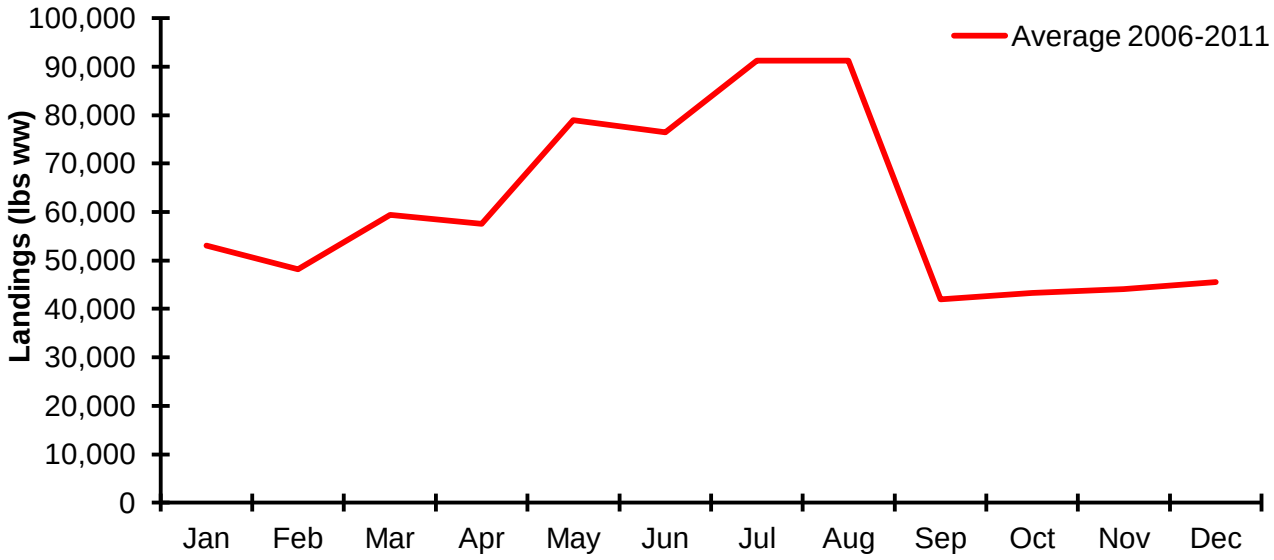

Figure 4.2.2. Average recreational landings of yellowtail snapper in the South Atlantic by month from 2006 through 2011.
Source: Marine Recreational Information Program (MRIP).

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).

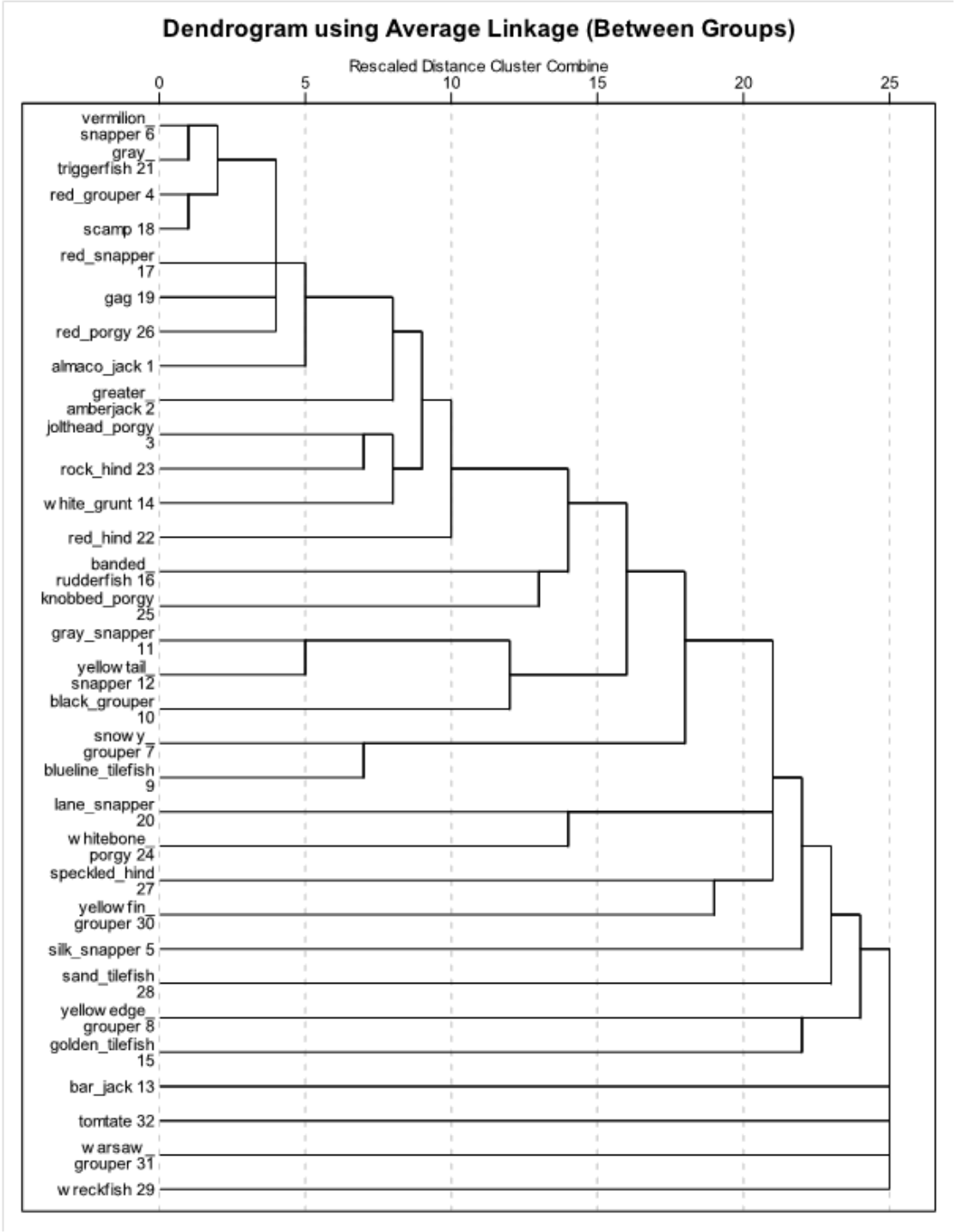

Figure 4.3.1. Hierarchical cluster analysis of species presence-absence in the snapper grouper commercial vertical line landings aggregated by year, month, area, and depth.
(Linkage Method: Between (Average), Dissimilarity Measure: Sørenson (Binary)). Numbers denote case numbers.
Source: SERO-LAPP-2010-06.

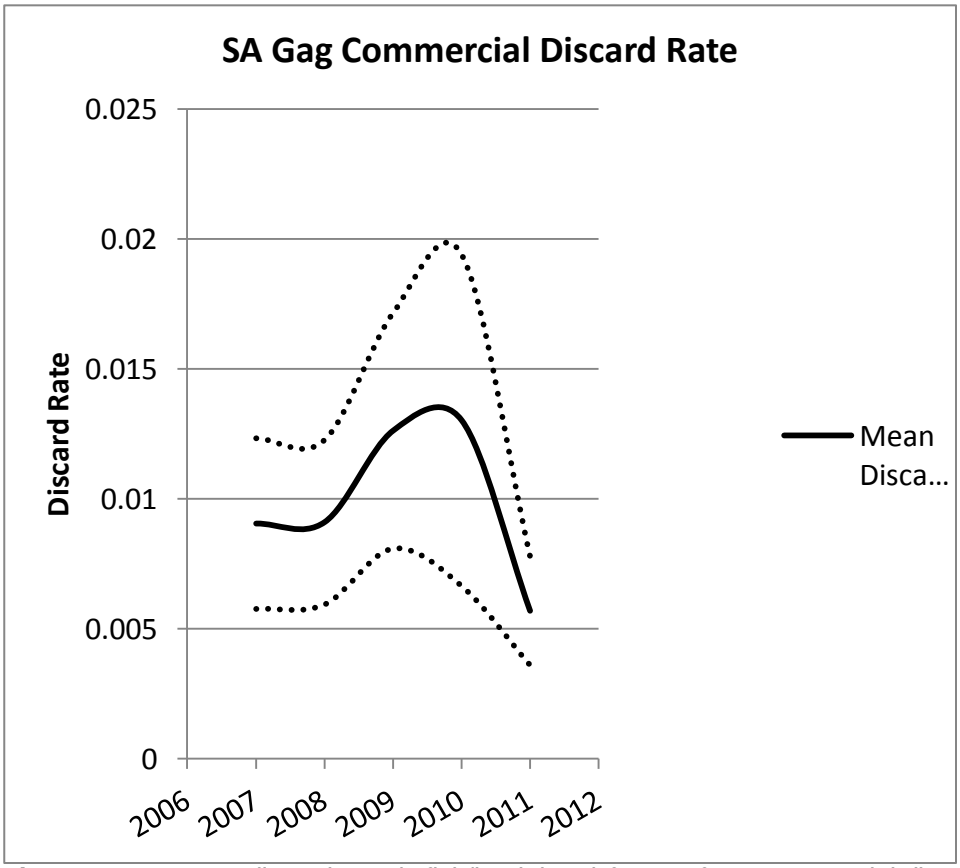

Figure 4.3.2. Mean discard rate (# fish/hook hour) for gag from commercial discard logbook data. Source: NMFS SERO

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.

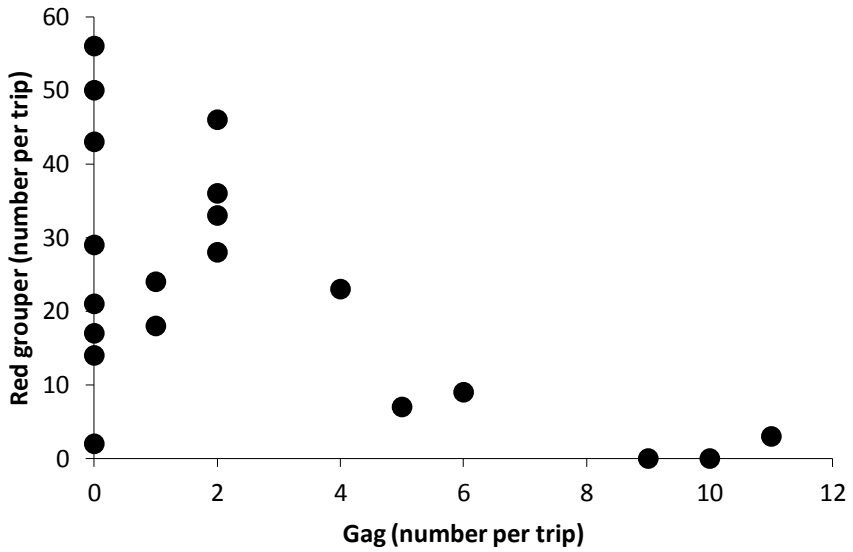

Figure 4.3.3. Number of red grouper per trip relative to the number of gag per trip on trips taken between May and August 2003 off North Carolina.
Source: J. Buckel, North Carolina State University, unpublished.

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

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