Regulatory Amendment 14 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region

Fishing seasons for greater amberjack, black sea bass, and vermilion snapper; trip limits for gag; and recreational AMs for black sea bass and vermilion snapper

Environmental Assessment Regulatory Impact Review

DECEMBER 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

SAFMC South Atlantic Fishery Management Council

SEDAR Southeast Data, Assessment, and Review

SEFSC Southeast Fisheries Science Center

SERO Southeast Regional Office

SIA social impact assessment

SPR spawning potential ratio

SSC Scientific and Statistical Committee

Regulatory Amendment 14 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region

Documents:	Environmental Assessment Regulatory Impact Review
Proposed actions:	This amendment considers modifications to the fishing years for greater amberjack and black sea bass; commercial fishing season for vermilion snapper; trip limits for gag; and revision of the recreational accountability measures for black sea bass and vermilion snapper.
Lead agency:	Regulatory Amendment 14 – South Atlantic Fishery Management Council EA/RIR – National Marine Fisheries Service (NMFS)
For Further Information Contact:	South Atlantic Fishery Management Council 4055 Faber Place, Suite 201 North Charleston, SC 29405 843-571-4366 866-SAFMC-10 Myra Brouwer Myra.Brouwer@safmc.net NMFS, Southeast Region 263 13th Avenue South St. Petersburg, FL 33701 727-824-5305 Nikhil Mehta Nikhil.Mehta@noaa.gov

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Summary

What Actions Are Being Proposed?

Regulatory Amendment 14 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP) proposes actions to: (1) modify the commercial and recreational fishing years for greater amberjack; (2) modify the recreational fishing year for black sea bass; (3) modify the recreational accountability measure (AM) for black sea bass; (4) modify the commercial fishing year for black sea bass; (5) change the commercial fishing seasons for vermilion snapper; (6) modify the trip limit for gag; and (7) modify the recreational AM for vermilion snapper.

Purpose for Action

The *purpose* for the proposed actions is to: modify the commercial and recreational fishing years for greater amberjack; modify the commercial and recreational fishing years for black sea bass; modify the commercial fishing season for vermilion snapper; modify trip limits for gag; and revise the recreational AMs for black sea bass and vermilion snapper.

Need for Action

The *need* for the proposed actions is to: enhance economic yield from commercial harvest of greater amberjack; allow harvest of black sea bass and vermilion snapper to occur during times of the year when harvest of co-occurring species is occurring; extend the commercial fishing season for gag; and ensure overfishing of greater amberjack, gag, black sea bass, and vermilion snapper does not occur.

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 to the National Marine Fisheries Service (NMFS) who ultimately approves, disapproves, or partially approves, and implements the actions in the amendment through the development of regulations on behalf of the Secretary of Commerce. NMFS is an agency in the National Oceanic and Atmospheric Administration within the Department of Commerce.

Why are the South Atlantic Council and NMFS Considering Action?

Fishing Year for Greater Amberjack

Snapper Grouper Regulatory Amendment 9 implemented a 1,200-pound trip limit for greater amberjack in 2011. Following this change in regulations, commercial landings for greater amberjack increased. In 2012, the Comprehensive Annual Catch Limit (ACL) Amendment reduced the commercial ACL/quota for greater amberjack from 1,169,931 pounds gutted weight (gw) to 769,388 pounds gw (800,163 pounds whole weight (ww)). The new commercial ACL of 769,388 lbs gw was not exceeded in the 2012-2013 fishing year; however, commercial harvest would have exceeded the new ACL in three out of the past six fishing years. This caused concern among some fishermen that the commercial ACL could be met before March, when there is increased demand for greater amberjack (i.e., consumers tend to buy more fish during Lent). Furthermore, greater amberjack migrate out of the Florida Keys by mid-May, thereby offering a limited fishing opportunity at the beginning of May, the start of the current fishing year.

Fishing Years for Black Sea Bass

The Council discussed changes in the start date of the black sea bass fishing year (both recreational and commercial) in 2010, during development of Regulatory Amendment 9. However, the Council decided not to make any changes at that time pending completion of a stock assessment. Since then, a stock assessment and an update were completed. Also, harvest of red snapper was allowed during two weekends in 2012. Unfortunately, the black sea bass recreational fishery closed before red snapper harvest was open. Fishermen expressed concern at the amount of black sea bass discards that resulted from the red snapper opening. In addition, the angling public had been reporting an overabundance of black sea bass and requested a change in management measures that would allow for year-round fishing. Due to all of these factors, the Council decided to reconsider a change in the start of the fishing years for black sea bass with the intent of trying to "line up" the seasons with other snapper grouper species commonly caught with black sea bass and thus reduce the amount of discards.

Amendment 18A modified management measures for the commercial sector and implemented an endorsement program for harvest with black sea bass pots. In 2012, the start of the commercial fishing year was delayed by a month in order for the endorsement program to be implemented. The delay caused the commercial harvest of black sea bass to begin at the same time as the commercial season for vermilion snapper. Fishermen maintained that "lining up" the start of the seasons was beneficial and markedly reduced the amount of discarded vermilion snapper. Hence the Council sought to again consider changing the start date of the black sea bass commercial fishing year to minimize regulatory discards.

Recreational Accountability Measure for Black Sea Bass

The Council introduced this action at its June 2013 meeting in response to the need of for-hire businesses to be able to plan their activities consistently while ensuring the recreational ACL is not exceeded. The intent is for NMFS to use either the recreational ACL or the Annual Catch Target (ACT) to calculate how long the season may last, and allow recreational harvest accordingly. Another option under this action would retain the in-season closure when the ACL is met or projected to be met but would remove the existing payback provision.

Commercial Seasons for Vermilion Snapper

By dividing the commercial quota into two six-month fishing seasons, vermilion snapper fishermen were given the opportunity to fish for the species at the beginning of the year and during the summer. The divided commercial quota also provided fishermen in the northern and southern areas of the South Atlantic a chance to fish for vermilion snapper when weather conditions were favorable. Currently, there is a derby in the vermilion snapper commercial fishery, in which the split quota is met and sometimes exceeded in just a few weeks. In addition to concerns about safety at sea that arise from the race to fish, the derby periods result in a large amount of vermilion snapper on the market in a very short period of time. Since the recent assessment of the vermilion snapper stock indicated the stock is in good condition and catch limits can go up, the Council wants fishermen to consider how they want the increase in the ACL allocated between the two season and whether modifying the start dates of the commercial seasons would be beneficial.

Trip Limits for Gag

On July 15, 2011, Regulatory Amendment 9 established a commercial trip limit of 1,000 pounds gutted weight for gag in an effort to slow down harvest and extend the season. However, the season closed early in 2012 and fishermen have requested additional measures to extend the season and minimize discard mortality. The Snapper Grouper Advisory Panel proposed that the Council take action in Regulatory Amendment 14 to consider a trip limit "step-down" to 300 pounds once 75% of the commercial ACL has been landed. AP members maintain that this would essentially create a bycatch allowance so commercial fishermen would be able to retain gag when they target other shallow water grouper species.

Recreational Accountability Measure for Vermilion Snapper

Amendment 16 to the Snapper Grouper FMP included actions to end overfishing of vermilion snapper. Among the management measures that were implemented was an annual 5-month closure (November through April) for the recreational sector. The recent vermilion snapper stock assessment update indicated that the South Atlantic stock of vermilion snapper is neither overfished nor undergoing overfishing. Therefore, Regulatory Amendment 18 implemented an action to remove the recreational closure. However, an in-season accountability measure is not currently in place for the recreational sector. Hence the proposed action in Regulatory Amendment 14 would implement in-season measures to ensure the recreational ACL for vermilion snapper is not exceeded. In addition, an option is included to only require a payback if the total ACL (commercial + recreational) is exceeded. That is, if recreational landings cause the total ACL to be exceeded, the recreational ACL in the following fishing year would be reduced by the amount of the overage.

Summary of Effects

Alternatives for Action 1
(preferred alternatives in **bold**)

1. (No Action). The current commercial and recreational fishing years begin on May 1 and end on April 30.

2. Modify the commercial and recreational fishing years for greater amberjack to begin on January 1 and end on December 31.

3. Preferred. Modify the commercial and recreational fishing years for greater amberjack to begin on March 1 and end on February 28.

Action 1. Modify the commercial and recreational fishing years for greater amberjack

Biological Effects

Commercial Sector

Figure S-1 displays the increase in greater amberjack commercial landings during March due to demand for the species during Lent. Landings drop to zero in April because harvest is prohibited to protect greater amberjack during the spawning season, which spans from January to June. Landings peak in May following the harvest prohibition and are fairly consistent during June through December.

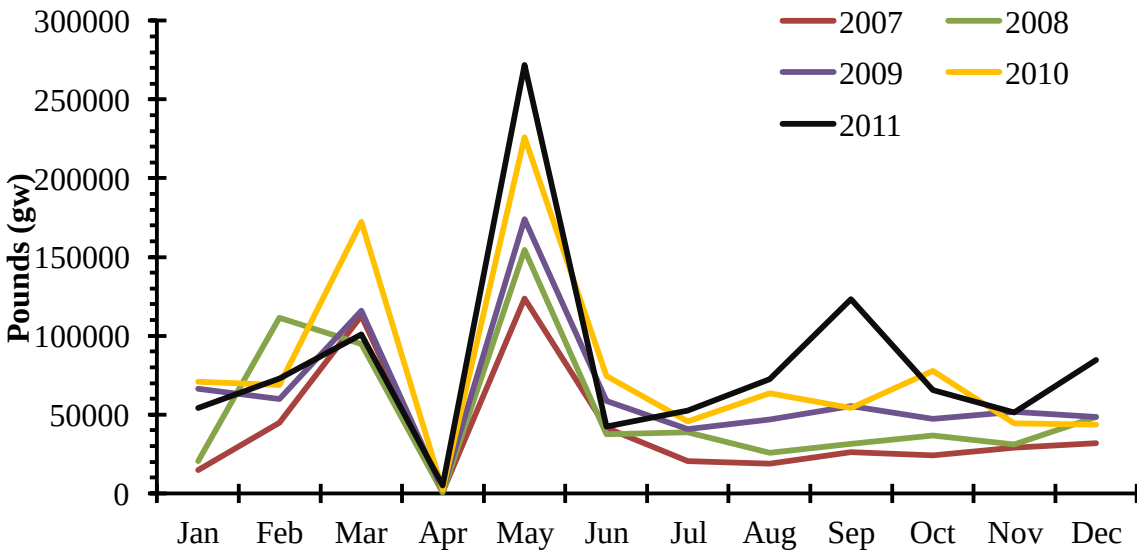

Figure S-1. South Atlantic greater amberjack commercial landings (gw) by month from 2007 to 2011.

With a fishing year beginning on May 1 and ending on April 30 (**Alternative 1, No Action**), it is expected that the commercial ACL of 800,163 lbs ww could be met during March if conditions were similar to those during the 2009 and 2010 fishing years (**Table S-1**). Under **Alternative 2** the fishing year would begin in January and a closure of commercial harvest could potentially occur in September. **Preferred Alternative 3** would start the fishing year in March and the ACL could be met in February (based on landings from 2009/2010) or December (based on landings from 2010/2011; **Table S-1**).

Table S-1. Predicted closure dates for the commercial sector of greater amberjack under all three alternatives. Predicted closure dates came from the years of data of 2006-2011.
Note: Predicted closure dates reflect current commercial ACL of 769,388 lbs gw.

Fishing Year	Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)
	May-Apr	Jan-Dec	Mar-Feb
2006/2007	No Closure	No Closure	**No Closure**
2007/2008	No Closure	No Closure	**No Closure**
2008/2009	No Closure	No Closure	**No Closure**
2009/2010	19-Mar	25-Sep	**23-Feb**
2010/2011	4-Mar	23-Sep	**6-Dec**

Some positive biological effects could be expected under **Preferred Alternative 3** since the commercial ACL could be met before the onset of the January-June spawning season and thus provide more protection to the species. Under **Alternative 2**, the commercial sector could be closed in September (based on 2010 and 2011 landings), three months before the end of the proposed fishing year (**Table S-1**). **Preferred Alternative 3** could also result in some negative biological effects when greater amberjack reopens in January, with fishers targeting the species heavily when the spawning period begins. However, greater amberjack is neither overfished nor undergoing overfishing, and ACLs/AMs are in place to ensure overfishing does not occur. Therefore, **Alternative 2** would not be expected to negatively impact the greater amberjack stock relative to **Alternative 1 (No Action)**. As shown in **Table S-1**, there would not be a closure of the commercial sector for greater amberjack based on landings in 2006/2007, 2007/2008, and 2008/2009, under all three alternatives. Therefore, biological benefits would be highest for **Alternative 1** (**No Action**), followed by **Preferred Alternative 3**, and **Alternative 2**.

Recreational Sector
Currently, the fishing season for the recreational sector is the same as the commercial sector, from May 1 to April 30 (**Alternative 1, No Action**). Harvest is limited to 1 greater amberjack per person per day. Additionally, in April of each year, for-hire/charter vessels are limited to 1 fish per person per day or 1 fish per person per trip, whichever is more restrictive.

During 2007-2012, recreational landings were highest in May/June and tapered off in September (**Figure S-2**). Recreational landings exceeded the current ACL of 1,167,837lbs ww in the 2008/2009 and 2009/2010 fishing years; however, landings decreased in 2010/2011. It is possible that the closure of red snapper in 2010 was responsible for the reduced landings of greater amberjack in 2010/2011, since greater amberjack co-occur with red snapper. Greater amberjack also co-occur with vermilion snapper, black sea bass, and gag. Therefore, restrictive management measures for these species may have also affected recreational landings of greater amberjack.

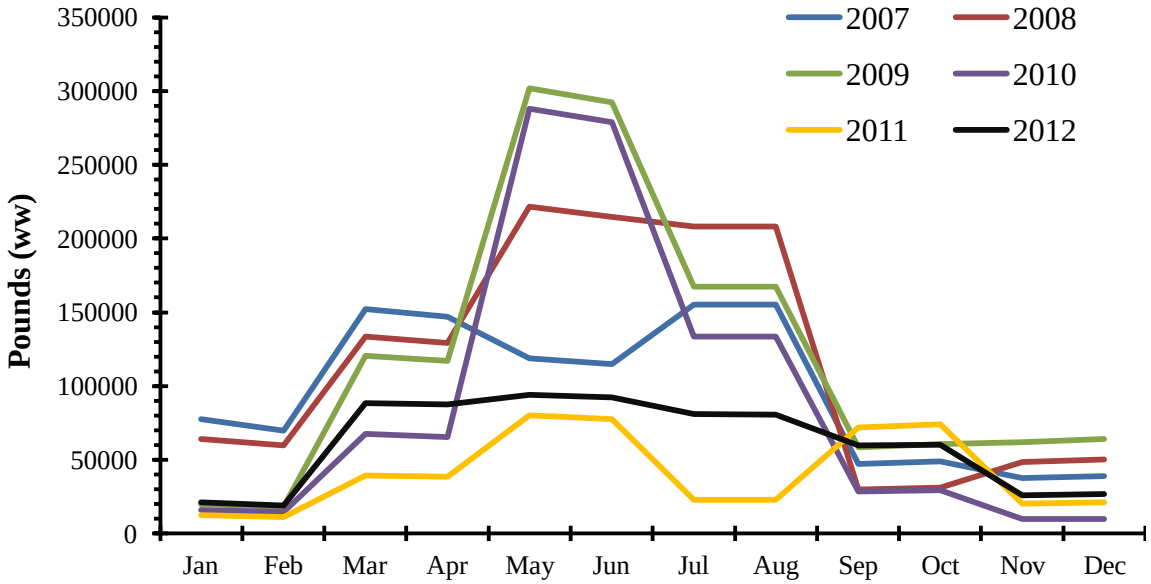

Figure S-2. South Atlantic greater amberjack recreational landings by month from 2007 to 2012. The recreational landings include MRFSS and HBS landings. Weight units are in whole weight to match the recreational ACL.

Table S-2 shows predicted dates the ACLs would be met for the greater amberjack recreational sector. Following the same logic in the discussion of the alternatives for the commercial sector, biological benefits would be greatest for **Alternative 1** (**No Action**), followed by **Alternative 3**, and **Preferred Alternative 2**.

Table S-2. Predicted dates recreational ACL would be met for all three alternatives for the recreational sector of greater amberjack in the South Atlantic using data are from 2006-2011.
The recreational landings include both MRFSS and HBS landings.

Fishing Year	Alternative 1	Alternative 3	Fishing Year	Alternative 2 (Preferred)
	May-Apr	Mar-Feb		Jan-Dec
2006/2007	Not Met	Not Met	2007	Not Met
2007/2008	Not Met	Not Met	2008	20-Aug
2008/2009	30-Mar	22-Oct	2009	24-Aug
2009/2010	28-Dec	31-Aug	2010	Not Met
2010/2011	Not Met	Not Met	2011	Not Met

Note: Predicted closure dates reflect current recreational ACL of 1,167,837 lbs ww.

Economic Effects

Commercial Sector

As long as the ACL is not exceeded, none of the alternatives in Action 1 are expected to have direct or indirect, positive or negative economic effects.

Recreational Sector

The relative ranking of alternatives based on their economic effects is possible only under the assumption that each alternative would result in a shortening of the following fishing season. Relative to

Alternative 1 (**No Action**), which would reduce the following recreational fishing year for greater amberjack by 1 to 4 months, **Alternative 2** would result in 4 to 5 months reduction in the following fishing season, and 3 months under **Preferred Alternative 3**. These values under **Alternatives 2** and **3 (Preferred)** are upper bounds, which assume a 1-month reduction in length of the following fishing season under **Alternative 1 (No Action)**, a 4-month reduction under **Alternative 2**, and a 6-month reduction under **Preferred Alternative 3**. The general expectation is that a longer season, or shorter season reduction the year following an ACL overage, would be more economically beneficial to the recreational sector as it affords more fishing opportunities for anglers and more trips for the for-hire vessels. In this sense, **Alternative 1** (**No Action**) may be ranked first, followed by **Alternative 2**, and **Preferred Alternative 3**.

Social Effects

Alternative 1 (No Action) could have some negative social effects on the Florida communities that are commercially or recreationally engaged and reliant on fishing and have relatively high landings at the regional level for greater amberjack. Some economic benefits to the commercial and for-hire fleets are missed due to migration of the fish out of the waters of south Florida and the Florida Keys early in the current season starting in May, in addition to limited fishing opportunities in the area for private recreational anglers. **Alternative 2** would allow harvest for a longer period of time before a late spring migration and would provide access to the stock during Lent season, which is important for the commercial sector as there is increased demand for fish. Additionally, under **Alternative 2**, greater amberjack would be more likely to be open during the winter tourism season in south Florida and the Florida Keys, which would benefit the communities and businesses associated. **Preferred Alternative 3** would also allow harvest before the spring migration of the fish and for harvest during Lent, but could forfeit some social and economic benefits of an open season during winter tourism season if the recreational ACL is met prior to the end of the fishing year.

Action 2. Modify the fishing year for the black sea bass recreational sector

Alternatives for Action 2
(preferred alternatives in **bold**)

1. No Action. The recreational fishing year for black sea bass begins on June 1 and ends on May 31.
2. Modify the recreational fishing year for black sea bass to begin on January 1 and end on December 31.
3. **Preferred. Modify the recreational fishing year for black sea bass to begin on April 1 and end on March 31.**
4. Modify the recreational fishing year for black sea bass to begin on October 1 and end on September 30.
5. Modify the recreational fishing year for black seas bass to begin on May 1 and end on April 30.

Biological Effects

If the start date of the recreational season remains June 1, as would be the case under **Alternative 1 (No Action)**, it is estimated that a quota closure would be necessary between September and March, with most scenarios suggesting November or December as the most likely closure month (**Table S-3**). Because the start of the fishing year is after peak spawning of black sea bass, and the recreational ACL is likely to be met at the beginning of the spawning season, **Alternative 1 (No Action)** is the most likely alternative to protect black sea bass when they are in spawning condition. However, black sea bass do not form temporary spawning aggregations like grouper species, and are not considered to be vulnerable to overfishing during the spawning season like shallow water grouper species. **Preferred Alternative 3** would not benefit the black sea bass stock as much as **Alternative 1 (No Action)**, since the latter overlaps directly with the peak of the spawning season in the South Atlantic region. However, **Preferred Alternative 3** would provide greater protection to black sea bass in spawning condition than **Alternative 2** since the spawning season begins in January, and **Alternative 2** would allow fishing for black sea bass throughout the January-May spawning season. Under **Preferred Alternative 3**, harvest of black sea bass would be prohibited during most of the January-April spawning season closure for shallow water grouper species. However, some bycatch of black sea bass would be expected during January-March when recreational fishermen target vermilion snapper. Release mortality of black sea bass, however, is estimated to be 7%. Under **Alternative 4**, the recreational fishing year would begin on October 1. Similar to **Alternative 2**, this alternative could allow for fishing activity during months of peak spawning for black sea bass and would have fewer positive biological effects than **Alternative 1 (No Action)** and **Preferred Alternative 3**. Like **Alternative 2**, harvest for black sea bass under **Alternative 4** would occur when fishermen are targeting vermilion snapper. **Alternative 5** would modify the recreational fishing year to begin on May 1. Depending on the rate of daily catch and fishing effort, the season could close in August or last until November (**Table S-3**). Similar to **Preferred Alternative 3**, **Alternative 5** would result in black sea bass being closed during part of the peak spawning months and thus would impart a similar level of biological benefit to the black sea bass stock. The onset of black sea bass harvest would coincide with that for shallow water grouper species, but there would be some incidental catch of black sea bass when recreational fishermen target vermilion snapper during January-April.

Table S-3. Projected closure dates and season length (days) for recreational fishing season alternatives in Action 2 under three different projection model runs, with 95% confidence intervals.
Note: These projections use the ACL from Regulatory Amendment 19 of 1,033,980 lbs ww.

	SARIMA			2012 (Jun-Aug), SARIMA (Sept-May)			GLM (Seasonal)		
Alternative	Mean	L95%	U95%	Mean	L95%	U95%	Mean	L95%	U95%
Alternative 1 (No Action): June 1-May 31	20-Sep 111	28-Oct 149	29-Aug 89	23-Dec 205	27-Feb 271	25-Nov 177	14-Nov 166	27-Mar 299	7-Sep 98
Alternative 2: January 1-December 31	2-May 121	6-Jun 156	7-Apr 96	18-Jun 168	10-Sep 252	15-May 134	14-Jul 194	28-Sep 270	3-Jun 153
Preferred Alternative 3: April 1-March 31	**17-Jul** **107**	**18-Aug** **139**	**27-Jun** **87**	**8-Oct** **190**	**8-Dec** **251**	**10-Sep** **162**	**21-Aug** **142**	**24-Nov** **237**	**6-Jul** **96**
Alternative 4: October 1-September 30	31-Jan 122	16-Mar 166	4-Jan 95	9-Apr 190	17-Jun 259	21-Feb 143	20-May 231	18-Jul 290	2-Apr 183
Alternative 5: May 1-April 30	15-Aug 106	17-Sep 139	27-Jul 87	11-Nov 194	10-Jan 254	15-Oct 167	24-Sep 146	4-Jan 248	31-Jul 91

Economic Effects

Projections on the recreational landings of black sea bass have determined that fishing closures would occur under each fishing season alternative, including the no action alternative (**Table S-3**). Projections also show that the length of the fishing season for black sea bass would differ among the various alternatives. This would create differing opportunities for trips taken by for-hire vessels. In general, a longer season would allow for more for-hire vessel trips, thus allowing these vessels to generate higher net operating revenue (NOR). A closer analysis of the NOR effects of the various fishing season alternatives reveal that the for-hire sector would be economically worse off under **Alternatives 2** and **4**, regardless of the model used for projecting quota closures. The for-hire sector would be economically better off under **Preferred Alternative 3** and **Alternative 5** when using the Mixed SARIMA model for closure projections (**Table S-3**). It may be noted that charter vessels would be economically better off under **Preferred Alternative 3** based on the GLM projection model for closures and under **Alternative 5** regardless of the model used for projecting closures.

Social Effects

Alternative 1 (No Action) would be expected to have no additional negative impacts on the recreational black sea bass sector, although some positive impacts could be forfeited if a different start date could help extend the season. However, there could be some localized impacts due to a change in the start date. For example, the start date of January 1 under **Alternative 2** would likely be the least beneficial for North Carolina and South Carolina if the recreational ACL is met before weather allows for fishing in the northern states. Those fishing communities in North Carolina and South Carolina that are more dependent upon recreational fishing are: Murrells Inlet and Little River in South Carolina;

Atlantic Beach, Carolina Beach, Morehead City, Wanchese, and Wrightsville Beach in North Carolina. However, **Alternative 2** could be beneficial to fishermen in Florida due to few fishing opportunities in the other states that might push the black sea bass harvest closer to the ACL. Communities in Florida more dependent upon recreational fishing are: Islamorada, Key West, Marathon, and St. Augustine. An opening in October under **Alternative 4** could affect recreational fishing opportunities due to hurricane season, holidays, school schedules, etc. **Preferred Alternative 3** and **Alternative 5** would likely not affect specific areas, but most likely have regional effects based on season length and regional fishing patterns and could result in shorter fishing seasons compared to **Alternative 1 (No Action)**.

Action 3. Modify the recreational accountability measure for black sea bass

Alternatives for Action 3*
(preferred alternatives in **bold**)

1. No Action. If the ACL is met or is projected to be met, independent of stock status, prohibit the harvest and retention of black sea bass. If the ACL is exceeded, reduce the recreational ACL in the following season by the amount of the overage.

2. (Preferred) NMFS will annually announce the recreational fishing season start and end dates. The fishing season will start on April 1 and end on the date NMFS projects the ACL will be met.

3. NMFS will annually announce the recreational fishing season start and end dates. The fishing season will start on April 1 and end on the date NMFS projects the ACT will be met.

4. If the ACL is met or is projected to be met, independent of stock status, prohibit the harvest and retention of black sea bass.

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

Biological Effects

Preferred Alternative 2 in this action is similar to Preferred Alternative 3 under Action 2. With an April 1 opening, the recreational black sea bass season could last until the end of June or early December, according to predictions in (**Table S-3**). NMFS would announce the length of the season based on predictions of when the recreational ACL would be met. Under **Alternative 3**, on the other hand, NMFS would use the recreational ACT to predict the length of the season instead. In this case, the recreational black sea bass season would be from 1 to three weeks shorter than that predicted for **Preferred Alternative 2** (**Table S-4**).

However, announcing the length of a fishing season prior to harvest being allowed, as would occur under both Preferred Alternative 2 and Alternative 3, could alter fishing behavior in a manner that would cause negative biological effects. The current in-season closure of recreational fishing once the ACL is met or projected to be met is designed to prevent ACL overages. On the other hand, Alternative 3 would carry greater biological benefits than Preferred Alternative 2 because basing the length of the season on when the ACT is expected to be met would help ensure that the ACL is not exceeded.

Table S-4. Projected closure dates and season length (days) for Action 3, Alternative 3 under three different projection model runs, with 95% confidence intervals.
Note these projections use the ACT from Regulatory Amendment 19 of 903,905 lbs ww.

SARIMA			2012 (Jun-Aug), SARIMA (Sept-May)			GLM (Seasonal)		
Mean	**L95%**	**U95%**	**Mean**	**L95%**	**U95%**	**Mean**	**L95%**	**U95%**
3-Jul	30-Jul	16-Jun	11-Sep	5-Nov	11-Aug	2-Aug	16-Oct	25-Jun
93	120	76	163	218	132	123	198	85

Under **Alternative 1 (No Action)**, fishermen would continue to benefit from the longest possible season with the least risk for an overage. Under **Preferred Alternative 2** and **Alternative 3**, however, the risk of an ACL overage increases because there would no longer be an in-season closure. However, setting the following year's fixed season under **Preferred Alternative 2** and **Alternative 3** would take into account the overages or underages in the previous year. Thus, the following year's fixed season would likely be shorter if overages occurred in the previous year or longer if the entire ACL or ACT were not landed in the previous year. In-season monitoring with an in-season closure announcement, as

under **Alternative 1 (No Action)**, allows the angler maximum time on the water and promotes harvest of the entire ACL. Under **Preferred Alternative 2** and **Alternative 3**, if the fishing rate is faster than projected due to the derby mentality previously discussed or an increase in the underlying stock size, the ACL could be exceeded because the length of the fishing season would be fixed and there would be no in-season closure to prevent an overage. **Alternative 4** would have similar biological effects as **Alternative 1 (No Action)**, but without the benefit of a payback if an ACL overage were to occur. However, the black sea bass stock is not undergoing overfishing and is rebuilt (SEDAR 25 Update 2013). Therefore, there may not be a biological need for a payback if overages of an ACL are not large, and occur infrequently.

In summary, in terms of biological benefits, **Alternative 1 (No Action)** would rank highest, followed by, **Alternative 4**, **Alternative 3** and **Alternative 2**.

Economic Effects

The long-term CS and NOR effects of the various alternatives would depend on their effects on the sustainability of the stock to support recreational fishing opportunities. In general, a more restrictive AM would have a higher probability of protecting the stock over the long term. Although the current stock assessment methodology accounts for overages by including them in the projections, overages especially at elevated levels cannot remain for long without impairing the stock. If the stock undergoes overfishing, or reverts to being overfished, more restrictive regulations will be needed, resulting in CS and NOR reductions. Along this line, **Alternative 1** (**No Action**) would appear to be the best AM alternative in maintaining the sustainability of the stock, especially because it requires paybacks in cases of overages. Unless the fishing season becomes too constrictive under **Preferred Alternative 2** or **Alternative 3**, the next best AM would appear to be **Alternative 4** as it has the ability to impose harvest closure once landings reach or are projected to reach the ACL or ACT. Between **Preferred Alternative 2** and **Alternative 3**, the latter may be considered to offer a higher probability of protecting the stock over the long term as it would be provide for a shorter fishing season.

In the absence of estimates of short-term, mid-term, and long-term effects on CS and NOR, it is not possible to determine which alternative would provide the best net economic effects over time. It may only be noted that actual balancing of the mid-term and long-term effects on CS and NOR would partly depend on how fast management can react to the changing status of the stock. This, in turn, would partly depend on timely knowledge of the status of the stock.

Social Effects

Recreational AMs can have significant direct and indirect social effects when triggered, because they can restrict harvest in the current season or subsequent seasons. While the negative effects are usually short-term, they may at times induce other indirect effects through changes in fishing behavior or business operations that could have long-term social effects. Reduced recreational fishing opportunities can change fishing behaviors through species switching if the opportunity exists, which can then increase pressure on other stocks or amplify conflict. If there are no opportunities to switch species, then losses of income or fishing opportunities may occur which can act like any downturn in an economy for fishing communities affected. While these negative effects are usually short term, they may at times induce other indirect effects through the loss of fishing infrastructure that can have a lasting effect on a community.

Annual establishment of firm opening and closing dates for each season under **Preferred Alternative 2** and **Alternative 3** would greatly reduce the uncertainty of when recreational anglers can fish for black sea bass, either on a private boat or through a for-hire trip. This would be expected to be significantly important for the for-hire businesses in that a trip could be booked in advance with no risk that recreational black sea bass harvest would be closed. Additionally, not creating set dates (**Alternative 1 (No Action)** or **Alternative 4**) could result in foregone benefits if a trip was not booked or planned for a future date but recreational harvest ended up being open at that time. In addition to benefits to clients, this reduced uncertainty would benefit business plans for charter and headboat businesses that cater to clients who wish to fish for one of the most popular species in the South Atlantic. Overall, setting a start and end date under **Preferred Alternative 2** and **Alternative 3** would reduce uncertainty and risk for the recreational sector.

Action 4. Modify the fishing year for the black sea bass commercial sector

Alternatives for Action 4*
(preferred alternatives in **bold**)

1. No Action. The commercial fishing year begins on June 1 and ends on May 31. Pots are prohibited from November 1 through April 30. The trip limit is 1,000 pounds gw for both the pot and hook-and-line sectors.

2. The commercial fishing year begins on July 1 and ends on June 30. Pots are prohibited from November 1 through April 30. The trip limit is 1,000 pounds gw for both the pot and hook-and-line sectors.

3. (Preferred) The commercial fishing year begins on January 1 and ends on December 31. Pots are prohibited from November 1 through April 30. From May 1 to October 31, the trip limit would be 1,000 pounds gw for pots. From May 1 to December 31, the trip limit would be 1,000 pounds gw for hook-and-line sector. From January 1 to April 30, the hook-and-line sector would be restricted to a trip limit of:

3a. 100 pounds gw
3b. 200 pounds gw
3c. 300 pounds gw (Preferred).

4. The commercial fishing year begins on May 1 and ends on April 30. Pots are prohibited from November 1 through April 30. The trip limit would be 1,000 pounds gw for both the pot and hook-and-line sectors.

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

Biological Effects

The biological effects of the alternatives for **Action 4** would be similar to those for **Action 2**. AMs are in place to ensure ACLs are not exceeded and overfishing does not occur. Therefore, biological effects of the various alternatives would be related to fishing effort during the black sea bass spawning season, and possible incidental catch of black sea bass when harvest for co-occurring species is open, or incidental catch of co-occurring species when black sea bass is open. Therefore, the most simplistic interpretation of the analyses would translate into **Alternative 1 (No Action)** being the most biologically beneficial among the alternatives proposed. However, there could be increased biological benefits from **Alternatives 3** and **4**, which would allow fishermen to retain incidentally caught black sea bass when using hook and line gear.

Economic Effects

Alternative 1 (No Action), **Alternative 2**, and **Alternative 4** could have higher positive economic effects for hook-and-line fishermen after November 1 each year when compared to the more restrictive hook-and-line trip limits proposed in **Sub-alternatives 3a-3c**. **Alternatives 3** and **4** could have direct negative economic effects for the pot portion of the commercial sector depending on whether the black sea bass fishery north of Hatteras remains open. If the northern fishery is still open when the South Atlantic black sea bass pot fishery is open, it could create a glut in the market and fishermen likely would receive a lower price for their fish.

Social Effects

Changes in the start date for the commercial black sea bass sector could result in increased access to the resource but also more frequent right whale interaction due to a potentially longer season. However, Regulatory Amendment 19 (under review) includes a measure that would prohibit the use of black sea bass pots during November 1 to April 30 to prevent interaction between black sea bass pots and large whales. The communities with high regional quotas for commercial black sea bass landings include Sneads Ferry and Wanchese in North Carolina, and Port Orange, Florida. However, changes in the

season are more likely to affect Sneads Ferry and Wanchese at the community level more than Port Orange as it is not as dependent upon fishing as the former.

The proposed pot sector closure from November 1- April 30 in Regulatory Amendment 19 could negatively impact the pot sector if the commercial ACL is not met before November 1. Therefore, any proposed alternatives that could contribute to allowing the pot fishermen to land as much of the ACL before the right whale calving season would be the most beneficial. Under this scenario, **Alternative 4** would be more beneficial to the pot fishermen than **Alternative 1 (No Action)** or **Alternative 2**. For the hook and line sector, there may be some benefit in removing pot effort through the right whale closure under **Alternatives 3** and **4**. **Alternative 3**, which has sub-options for varying trip limits, would also have varied social effects depending upon which trip limit is chosen.

Action 5. Modify the commercial fishing seasons for vermilion snapper

Alternatives for Action 5*

(preferred alternatives in **bold**)

1. **Preferred. No Action. The commercial fishing year for vermilion snapper is split into two seasons. The first season starts on January 1, and the second season starts on July 1. The ACL is divided equally between the two seasons.**

2. The commercial fishing year for vermilion snapper is split into two seasons, each with its own ACL. 100% of the new ACL implemented through Regulatory Amendment 18 is applied to the second season.
   - 2a. Second season start date = July 1.
   - 2b. Second season start date = June 1.
   - 2c. Second season start date = May 1.

3. The commercial fishing year for vermilion snapper is split into two seasons, each with its own ACL. 25% of the new ACL implemented through Regulatory Amendment 18 is applied to the first season and 75% of the new ACL implemented through Regulatory Amendment 18 is applied to the second season.
   - 3a. Second season start = July 1.
   - 3b. Second season start date = June 1.
   - 3c. Second season start date = May 1.

*See Chapter 2 for a more detailed description of the

Biological Effects

By dividing the commercial quota into two six-month fishing seasons, fishermen can harvest vermilion snapper at the beginning of the year and during the summer. The divided commercial quota also provides fishermen in the northern and southern areas of the South Atlantic a chance to fish for vermilion snapper when weather conditions were favorable.

The biological consequences for changing split season commercial ACLs, and modifying the start of the two fishing seasons of vermilion snapper under **Alternatives 2** and **3** (and their related sub-alternatives) are likely to be negligible, since overall harvest would be limited to the sector ACL and split-season ACLs. Furthermore, AMs would be triggered if the ACLs were exceeded. With the increased ACLs under Regulatory Amendment 18 (under review), the issue of discards due to early seasonal closures is highly reduced. Additionally, quota-monitoring efforts have improved over the past year, which would reduce the risk that the commercial ACL would be exceeded.

Economic Effects

In terms of economic effects, Action 5 is largely a management decision as to when the fish are to be caught. Since the commercial ACL has been caught each year, and the estimates provided in **Table S-5** indicate that the ACLs will continue to be completely caught no matter which alternative is chosen. As long as there are no significant seasonal ex-vessel price-per-pound fluctuations for vermilion snapper, there are no differences in the economic effects for when the seasons begin, or what percentage of the overall ACL goes to either season.

Table S-5. Predicted closure dates for both commercial fishing seasons for vermilion snapper in 2013. The predicted closure dates for Season 2 incorporate the alternatives changes to both the ACL and the start date of the season. No changes to the start date are proposed for Season 1.

Season 1						
	Preferred Alt. 1 (No Action)		Alt. 2		Alt. 3	
2013 ACL (lbs ww)	466,480		326,527		396,504	
Scenario	1	2	1	2	1	2
Closure Date	**23-Apr**	**5-Apr**	5-Mar	3-Mar	30-Mar	21-Mar
Season 2						
	Preferred Alt. 1 (No Action)		Alt. 2		Alt. 3	
2013 ACL (lbs ww)	466,480		606,433		536,457	
Scenario	1	2	1	2	1	2
July 1st Start Date	**12-Oct**	**20-Oct**	1-Nov	25-Nov	21-Oct	9-Nov
June 1st Start Date	**12-Sep**	**20-Sep**	2-Oct	26-Oct	21-Sep	10-Oct
May 1st Start Date	**12-Aug**	**20-Aug**	1-Sep	25-Sep	21-Aug	9-Sep

Social Effects

In general, the longer the season can stay open, the more benefits to the commercial fleet. Additionally, a vermilion snapper season that can be open at the same time as harvest for other co-occurring species (such as black sea bass) can help reduce discards and improve efficiency of trips. Overall, it is difficult to assess whether there are substantial social effects with any of the alternatives. **Preferred Alternative 1 (No Action)** may offer more positive social effects just from the point of stability in management but there are shorter second seasons in comparison to other alternatives. The other alternatives do provide various different lengths to the season with **Alternative 2** and its sub-alternatives providing some of the longest second season lengths and **Alternative 3** and its sub-alternatives offering more of an even split between the seasons than **Alternative 2**, but shorter first seasons than **Preferred Alternative 1 (No Action)**.

Action 6. Modify the trip limit for the commercial sector for gag

Alternatives for Action 6
(preferred alternatives in **bold**)

1. (No Action). The commercial trip limit for gag is 1,000 pounds gutted weight (lbs gw).

2. Preferred. Reduce the trip limit when 75% of the gag commercial ACL is landed.

2a. Reduce the trip limit to 100 lbs gw
2b. Reduce the trip limit to 200 lbs gw
2c. Reduce the trip limit to 300 lbs gw
2d. Reduce the trip limit to 400 lbs gw
2e. Preferred. Reduce the trip limit to 500 lbs gw

Biological Effects

The biological effects of **Alternatives 1 (No Action)** through **3** would be expected to be neutral because ACLs and AMs are in place to ensure overfishing does not occur. **Alternative 1 (No Action)** could present a greater biological risk than **Preferred Alternative 2**, since no step-down trip limit would be in place to slow down the rate in harvest and help ensure the ACL is not exceeded. However, improvements have been made to the quota monitoring system, and the South Atlantic and Gulf Councils are completing a Dealer Reporting Amendment, which should enhance data reporting. Furthermore, AMs are in place to ensure overfishing does not occur. Trip limits specified under **Preferred Alternative 2** could provide biological benefits to the South Atlantic gag stock since the harvest would be reduced when landings were close to reaching the commercial ACL. This provision could help ensure that overages do not occur and could result in biological benefits. However, any biological benefits associated with **Preferred Alternative 2** would be expected to be small. The ACL would be expected to be met in December with a trip limit of 100 lbs gw that would be implemented when 75% of the ACL was met (**Sub-alternative 2a**). Larger trip limits would not constrain catch and would result in the ACL being met earlier in the year. Trip limits greater than 300 lbs gw (**Preferred Sub-alternative 2c**) would have a similar effect to the status quo **Alternative 1 (No Action)**. **Table S-6** shows the predicted closure dates under the various **Preferred Alternative 2** sub-alternatives.

Table S-6. Predicted closure dates for the South Atlantic gag fishery with the trip limits implemented after 75% of the ACL is reached.
Closure dates were predicted for the current ACL (352,940 lbs gw) and the proposed ACL in Regulatory Amendment 15 (326,722 lbs gw).

Trip Limit	ACL = 352,940 lbs gw		ACL = 326,722 lbs gw	
	2011 Data	2012 Data	2011 Data	2012 Data
	Closure Date	Closure Date	Closure Date	Closure Date
2a. 100	23-Dec	No Closure	2-Dec	11-Dec
2b. 200	27-Oct	20-Nov	16-Oct	1-Nov
2c. 300	**16-Oct**	**6-Nov**	**27-Sep**	**19-Oct**
2d. 400	4-Oct	1-Nov	23-Sep	13-Oct
2e. 500	29-Sep	29-Oct	17-Sep	10-Oct

Economic Effects

Lengthening the season through instituting trip limits is not likely to increase the ex-vessel price per pound received by fishermen unless the gag season can be extended into a period where no other similar snapper grouper species are available to buyers. Therefore, while **Alternative 1 (No Action)** is not

expected to change the length of the commercial fishing season, it is expected to have the least direct negative economic effect on commercial snapper grouper fishermen. **Sub-alternatives 2a** through **2e** (including **Preferred Sub-alternative 2c**), in that order, would be expected to have the most to the least direct negative economic effect.

Social Effects

In general, a step down in a commercial trip limit may help slow the rate of harvest, lengthen a season, and prevent the ACL from being exceeded. However, trip limits that are too low may make fishing trips inefficient and too costly if fishing grounds are too far away. **Preferred Alternative 2, Sub-alternative 2c** would be expected to reduce the derby effects and associated negative impacts. If the longest expected season results in the greatest social benefits, **Preferred Alternative 2, Sub-alternative 2a** will be the most beneficial to the commercial fleet in terms of lengthening the season. However, while trip limits may extend the length of the fishing season, this management measure would be expected to alter the profitability of some trips, jeopardizing normal fishing behavior, revenues, and social benefits. It is assumed for the purposes of this discussion that the greater the economic losses, the greater the social losses. Social benefits would likely be maximized as a result of some trade-off between season length and economic changes.

Action 7. Modify the recreational accountability measure for vermilion snapper

Alternatives for Action 7*
(preferred alternatives in **bold**)

1. No action. If recreational landings reach or are projected to reach the ACL, and vermilion snapper are overfished, the harvest is prohibited for the remainder of the fishing year. Without regard to overfished status, if landings exceed the ACL, the ACL for next fishing year will be reduced by the amount of the overage.

2. If recreational landings reach or are projected to reach the ACL, harvest is prohibited for the remainder of the fishing year. If landings exceed the ACL, the ACL for the following fishing year will be reduced by the amount of the overage.

3. If recreational landings reach or are projected to reach the ACL, harvest is prohibited for the remainder of the fishing year.

4. **Preferred. If recreational landings reach or are projected to reach the recreational ACL, harvest is prohibited for the remainder of the fishing year. Payback of the overage would only take place if vermilion snapper are overfished and the Total ACL is exceeded due to an overage in the recreational ACL. The amount of the overage would be deducted from the following year's recreational ACL.**

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

Biological Effects

Alternative 1 (No Action) would be expected to yield the least biological benefit since it would not provide any in-season protection against overfishing. Vermilion snapper are not overfished and the in-season closure would only be in effect if the stock was overfished. **Alternative 2** is the most conservative of the alternatives since it includes both an in-season closure and a payback provision, and hence would yield the highest biological benefit. **Alternative 3** would provide an in-season closure but there would be no payback provision in the following fishing year if the ACL was exceeded.

Preferred Alternative 4 provides an in-season closure, but payback provisions would only go into effect if the species were overfished and the total ACL (commercial + recreational) was exceeded. Currently, there is no payback provision in place for the commercial sector. Payback of the amount of a recreational overage would include a deduction from the following year's recreational ACL. In terms of biological effects, **Alternative 2** and **Alternative 1 (No Action)** would be the most and least beneficial, respectively.

Economic Effects

In the absence of estimates of mid-term and long-term effects on consumer surplus (CS) and net operating revenue (NOR), it is not possible to determine which alternative would provide the best net effects over time. It may only be noted that actual balancing of the mid-term and long-term effects on CS and NOR would partly depend on how fast management can react to the changing status of the stock. This, in turn, would partly depend on timely knowledge of the status of the stock over time.

Social Effects

In general, the most long-term benefits for the stock and for sustainable recreational fishing opportunities, is a combination of an in-season closure and a payback provision. However, some flexibility in how these AMs are triggered can help to mitigate the negative short-term impacts on the

recreational sector. **Alternative 1 (No Action)** includes both an in-season closure and payback but with the in-season closure occurring if the species is overfished, which could trigger a payback without the ability to slow or stop harvest. **Alternative 2** would provide both an in-season closure and a payback provision if the recreational sector ACL was exceeded. **Preferred Alternative 4** would allow the payback only if the total ACL is exceeded and vermilion snapper are overfished, which provides some flexibility to the recreational sector if a portion of the commercial ACL is not used. **Alternative 3** would not include a payback provision, which could have longer-term impacts if the recreational ACL is exceeded several years in a row.

Chapter 1. Introduction

1.1 What Actions Are Being Proposed?

Regulatory Amendment 14 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP) proposes actions to: (1) modify the commercial and recreational fishing years for greater amberjack; (2) modify the recreational fishing year for black sea bass; (3) modify the recreational accountability measure (AM) for black sea bass; (4) modify the commercial fishing year for black sea bass; (5) modify the commercial fishing seasons for vermilion snapper; (6) modify the trip limit for gag; and (7) modify the recreational AM for vermilion snapper.

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 Administrator 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 to the National Marine Fisheries Service (NMFS) who ultimately approves, disapproves, or partially approves, and implements the actions in the amendment through the development of regulations 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 (EEZ) 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**). Species included in Regulatory Amendment 14 are among the sixty species managed by the South Atlantic Council under the Snapper Grouper FMP.

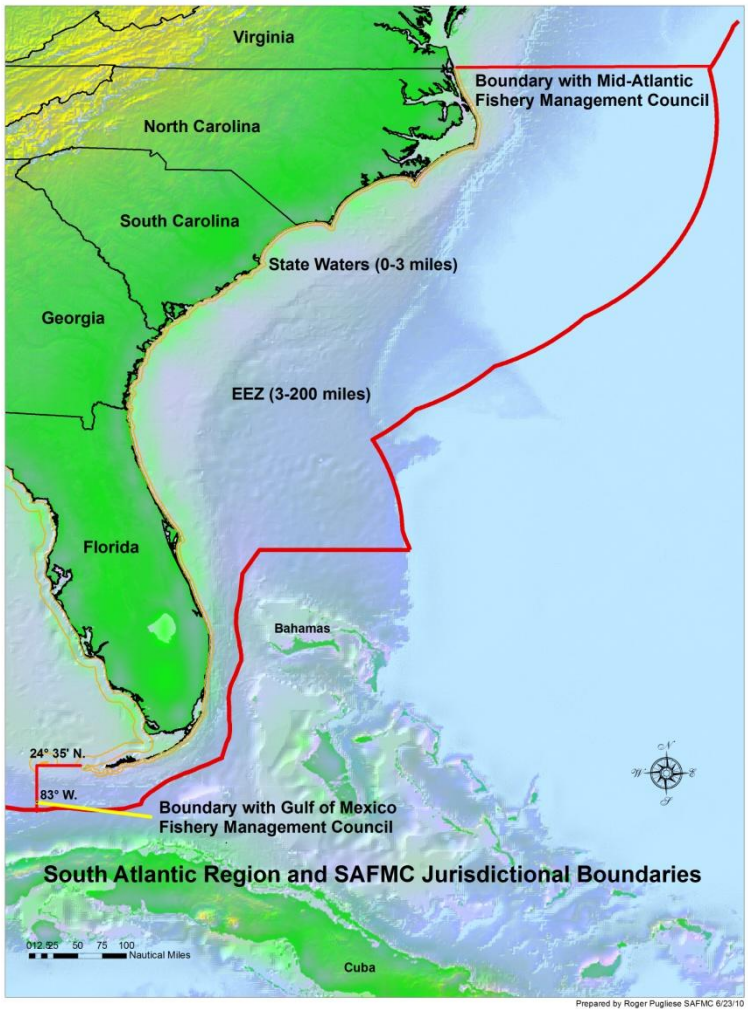

Figure 1.3.1. Jurisdictional boundaries of the South Atlantic Council.

1.4 Purpose and Need

Purpose for Actions

The purpose for the actions is to: modify the commercial and recreational fishing years for greater amberjack; modify the commercial and recreational fishing years for black sea bass; modify the commercial fishing season for vermilion snapper; modify trip limits for gag; and revise the recreational AMs for black sea bass and vermilion snapper.

Need for Actions

Enhance economic yield from commercial harvest of greater amberjack; allow harvest of black sea bass and vermilion snapper to occur during times of the year when harvest of co-occurring species is occurring; extend the commercial fishing season for gag; and ensure overfishing of greater amberjack, gag, black sea bass, and vermilion snapper does not occur.

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

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

Chapter 2. Proposed Actions and Alternatives

2.1 Action 1. Modify the commercial and recreational fishing years for greater amberjack

Alternative 1 (No Action). The current commercial and recreational fishing years begin on May 1 and end on April 30.

Alternative 2. Modify the commercial and recreational fishing years for greater amberjack to begin on January 1 and end on December 31.

Preferred Alternative 3. Modify the commercial and recreational fishing years for greater amberjack to begin on March 1 and end on February 28.

2.1.1 Comparison of Alternatives

Commercial Sector

With a fishing year beginning on May 1 and ending on April 30 (**Alternative 1, No Action**), it is expected that the commercial annual catch limit (ACL) of 800,163 pounds whole weight (lbs ww) could be met during March, if conditions were similar to those during the 2009 and 2010 fishing years. Under **Alternative 2**, the fishing year would begin in January and a closure of commercial harvest could potentially occur in September. **Preferred Alternative 3** would start the fishing year in March and commercial harvest could be closed in February (based on landings from 2009/2010) or in December (based on landings from 2010/2011). Some biological effects (i.e., direct and indirect effects on the subject species and associated species, including ecosystem services) would be expected to be positive under **Preferred Alternative 3**, since a closure that overlaps with the January-June spawning season would provide more protection to the species. Biological effects could also be beneficial under **Alternative 2**, since there would be a total of four months of no harvest (including the April closure). However, negative biological effects could occur when greater amberjack reopens in January, with fishers targeting the species heavily when the spawning period begins. Given the increased interest in the harvest of this species, biological benefits would be highest for **Alternative 1** (**No Action**) relative to **Alternative 2** since harvest would not begin until after the spawning season has ended. **Alternative 1 (No Action)** would also result in positive biological effects relative to **Preferred Alternative 3**.

As long as the ACL is not exceeded, none of the alternatives in Action 1 are expected to have direct or indirect, positive or negative economic effects. However, under **Alternative 1 (No Action)**, some economic benefits to the commercial and for-hire fleets are missed due to migration of the fish out of the waters of south Florida and the Florida Keys in May, in addition to providing limited fishing opportunities in the area for private recreational anglers. **Alternative 2** would allow harvest for a longer period of time before a late spring migration and would provide access to the stock during Lent, which is important for the commercial sector as there is increased demand for fish during this time. The fishing communities of

Cocoa, Key Largo, and Miami, Florida have the most significant commercial landings of greater amberjack.

Recreational Sector

Currently, the fishing season for the recreational sector is the same as the commercial sector, from May 1 to April 30 (**Alternative 1, No Action**). There is no spawning season closure for the recreational sector; however, harvest is limited to 1 greater amberjack per person per day. Additionally, in April of each year, for-hire/charter vessels are limited to 1 fish per person per day or 1 fish per person per trip, whichever is more restrictive. The biological benefits resulting from a change in the recreational fishing year would be the same as those resulting from a change in the commercial fishing year.

The general expectation is that a longer season, or shorter season reduction the year following an ACL overage, would be more economically beneficial to the recreational sector as it affords more fishing opportunities for anglers and more trips for the for-hire vessels. In this sense, **Alternative 1** (**No Action**) may be ranked first, followed by **Alternative 2**, and **Preferred Alternative 3**. **Preferred Alternative 3** would result in net operating revenue (NOR) reductions relative to **Alternative 1 (No Action)** and higher NOR reductions than **Alternative 2**. It would appear, however, that charter boats might be economically better off under **Alternative 2**. Important communities for recreational harvest of greater amberjack include Key West, Islamorada, Key Largo, and Miami. These Florida communities would be expected to be affected by changes in the fishing year for greater amberjack.

There would be no new administrative burden from **Alternative 2** or **Preferred Alternative 3**, since the current fishing year is already being monitored under **Alternative 1** (**No Action**). As expected with any changes to regulations, administrative costs would be associated with disseminating the information and educating the public.

2.2 Action 2. Modify the fishing year for the black sea bass recreational sector

Alternative 1 (No Action). The recreational fishing year for black sea bass begins on June 1 and ends on May 31.

Alternative 2. Modify the recreational fishing year for black sea bass to begin on January 1 and end on December 31.

Preferred Alternative 3. Modify the recreational fishing year for black sea bass to begin on April 1 and end on March 31.

Alternative 4. Modify the recreational fishing year for black sea bass to begin on October 1 and end on September 30.

Alternative 5. Modify the recreational fishing year for black seas bass to begin on May 1 and end on April 30.

2.2.1 Comparison of Alternatives

Alternative 1 (No Action) is the most likely alternative to protect black sea bass when they are in spawning condition. However, black sea bass do not form temporary spawning aggregations like grouper species, and are not considered to be vulnerable to overfishing during the spawning season like shallow water grouper species. **Preferred Alternative 3** would not benefit the black sea bass stock as much as **Alternative 1 (No Action)**, since the latter overlaps directly with the peak of the spawning season in the South Atlantic region. However, **Preferred Alternative 3** would provide greater protection to black sea bass in spawning condition than **Alternative 2** since the spawning season begins in January, and **Alternative 2** would allow fishing for black sea bass throughout the January-May spawning season. Under **Preferred Alternative 3**, harvest of black sea bass would be prohibited during most of the January-April spawning season closure for shallow water grouper species. However, some bycatch of black sea bass would be expected during January-March when recreational fishermen target vermilion snapper. Release mortality of black sea bass, however, is estimated to be 7%. Under **Alternative 4**, the recreational fishing year would begin on October 1. Similar to **Alternative 2**, this alternative could allow for fishing activity during months of peak spawning for black sea bass and would have fewer positive biological effects than **Alternative 1 (No Action)** and **Preferred Alternative 3**. Like **Alternative 2**, harvest for black sea bass under **Alternative 4** would occur when fishermen are targeting vermilion snapper. **Alternative 5** would modify the recreational fishing year to begin on May 1. Depending on the rate of daily catch and fishing effort, the season could close in August or last until November. Similar to **Preferred Alternative 3**, **Alternative 5** would result in black sea bass being closed during part of the peak spawning months and thus would impart a similar level of biological benefit to the black sea bass stock. The onset of black sea bass harvest would coincide with that for shallow water grouper species, but there would be some incidental catch of black sea bass when recreational fishermen target vermilion snapper during January-April.

The varying length of the fishing seasons under the alternatives would create differing opportunities for for-hire vessels. In general, a longer season would allow for more for-hire vessel trips, thus allowing these vessels to generate higher net operating revenue (NOR). A closer analysis of the NOR effects reveals that the for-hire sector would be economically worse off under **Alternatives 2** and **4**. The for-hire sector would be economically better off under **Preferred Alternative 3** and **Alternative 5** under one of the projection models. It is noted that charter vessels would be economically better off under **Preferred Alternative 3** based on one of the projection models and under **Alternative 5** regardless of the model used for projecting closures.

There could be some localized social impacts due to a change in the start date of the recreational fishing year. For instance, the proposed start date of January 1 under **Alternative 2** would likely be the least beneficial for North Carolina and South Carolina if the recreational ACL is met before weather allows for fishing in those states. Those fishing communities that are more dependent upon recreational fishing are: Murrells Inlet and Little River in South Carolina; and Atlantic Beach, Carolina Beach, Morehead City, Wanchese, and Wrightsville Beach in North Carolina. However, **Alternative 2** could be beneficial to fishermen in Florida due to few fishing opportunities in the other states that might push the black sea bass harvest closer to the ACL. Communities in Florida more dependent upon recreational fishing are: Islamorada, Key West, Marathon, and St. Augustine. An opening in October under **Alternative 4** could affect recreational fishing opportunities due to hurricane season, holidays, school schedules, etc. **Preferred Alternative 3** and **Alternative 5** would likely not affect specific areas, but would most likely have regional effects based on season length and regional fishing patterns and could result in shorter fishing seasons compared to **Alternative 1 (No Action)**.

The administrative costs and time burdens under **Alternatives 2** through **5** are not expected to be significantly different from the current burden under **Alternative 1** (**No Action**).

2.3 Action 3. Modify the recreational accountability measure for black sea bass

Alternative 1 (No Action). If the recreational sector black sea bass ACL is met or is projected to be met, independent of stock status, prohibit the harvest and retention of black sea bass. If the recreational sector black sea bass ACL is exceeded, independent of stock status, the Regional Administrator shall publish a notice to reduce the recreational sector ACL in the following season by the amount of the overage.

Preferred Alternative 2. For the black sea bass recreational sector, NMFS will annually announce the recreational fishing season start and end dates in the *Federal Register* and by other methods, as deemed appropriate. The fishing season will start on April 1 and end on the date NMFS projects the recreational ACL will be met.

Alternative 3. For the black sea bass recreational sector, NMFS will annually announce the recreational fishing season start and end dates in the *Federal Register* and by other methods, as deemed appropriate. The fishing season will start on April 1 and end on the date NMFS projects the recreational ACT will be met.

Alternative 4. If the recreational sector black sea bass ACL is met or is projected to be met, independent of stock status, prohibit the harvest and retention of black sea bass.

2.3.1 Comparison of Alternatives

Similar to the preferred alternative under the previous action, **Preferred Alternative 2** would open recreational harvest of black sea bass on April 1, and the recreational season could last until the end of June or early December. NMFS would announce the length of the season, prior to April 1 each year, based on predictions of when the recreational ACL would be met. Under **Alternative 3**, NMFS would use the recreational ACT to predict the length of the season instead of the ACL. In this case, the recreational black sea bass season would be from one to three weeks shorter than that predicted for **Preferred Alternative 2**. However, announcing the length of a fishing season prior to harvest being allowed, as would occur under both **Preferred Alternative 2** and **Alternative 3**, could promote a derby mentality and result in negative biological effects. **Alternative 3** would carry greater biological benefits than **Preferred Alternative 2** because basing the length of the season on when the ACT is expected to be met would ensure that the ACL is not exceeded. Under **Alternative 1 (No Action)**, fishermen would continue to benefit from the longest possible season with the least risk for an overage. **Alternative 4** would have similar biological effects as **Alternative 1 (No Action)**, but without the benefit of a payback if an ACL overage were to occur. However, the black sea bass stock is not undergoing overfishing and is rebuilt (SEDAR 25 Update 2013). Therefore, there may not be a biological need for a payback if overages of an ACL are not large, and occur infrequently. In terms of biological benefits, **Alternative 1 (No Action)** would rank highest, followed by **Alternative 4**, **Alternative 3**, and **Preferred Alternative 2**.

The long-term effects of the various alternatives on consumer surplus (CS) and net operating revenue (NOR) would depend on their effects on the sustainability of the stock to support recreational fishing opportunities. In general, a more restrictive accountability measure (AM) would have a higher probability of protecting the stock over the long term. **Alternative 1 (No Action)** would appear to be the best

approach to maintaining the sustainability of the stock. Between **Preferred Alternative 2** and **Alternative 3**, the latter may offer a higher probability of protecting the stock over the long term as it would result in a shorter fishing season. In the absence of estimates of short-term, mid-term, and long-term effects on CS and NOR, it is not possible to determine which alternative would provide the best net economic effects over time. It may only be noted that actual balancing of the mid-term and long-term effects on CS and NOR would partly depend on how fast management can react to the changing status of the stock. This, in turn, would partly depend on timely knowledge of the status of the stock over time. If overages were to occur under **Alternative 1** (**No Action**), they would also occur at about the same level under **Alternative 4** because both alternatives have an identical in-season AM. Therefore, it is expected that the CS effects of **Alternative 1** (**No Action**) would be the same as those of **Alternative 4** even in the presence of overages. Over the short term, **Preferred Alternative 2** would likely result in the highest CS effects, followed likely by **Alternative 3** and then by **Alternative 1 (No Action)** or **Alternative 4.**

Longer seasons offer more opportunity and choice for recreational fishermen. However, by announcing the start and end date for the fishing season, as proposed under **Preferred Alternative 2** and **Alternative 3**, there can be substantial changes in fishing behavior as fishermen anticipate a closure and begin increasing fishing pressure which can lead to a derby fishery. Derby fisheries can often lead to overages and are perceived as poor management. Because the payback AM would be removed in **Alternative 4**, the in-season closure currently in place would be the only mechanism to address excessive recreational harvest of black sea bass. Paybacks would likely result in even earlier closures in subsequent seasons, which could produce a domino effect that could negatively impact the recreational sector in the short term and long term, but this would not be expected under **Alternative 4**. However, if continued overages occurred, these would be expected to negatively impact the black sea bass stock, which would likely result in long-term negative impacts on future recreational fishing opportunities.

Preferred Alternative 2 and **Alternative 3** would add to the administrative burdens compared to **Alternative 1 (No Action)**. Under **Alternative 3**, the ACT would have to be monitored in addition to the ACL (**Preferred Alternative 2**). These additional announcements could also cause confusion and pose difficulties in enforcing the regulations. Administratively, **Alternative 4** would be the least burdensome of all the alternatives under this action.

2.4 Action 4. Modify the fishing year for the black sea bass commercial sector

Alternative 1 (No Action). The commercial fishing year for black sea bass begins on June 1 and ends on May 31. Black sea bass pots are prohibited from November 1 through April 30. The trip limit is 1,000 pounds gutted weight (lbs gw) for both the pot and hook-and-line sectors.

Alternative 2. Modify the commercial fishing year for black sea bass to begin on July 1 and end on June 30. Black sea bass pots are prohibited from November 1 through April 30. The trip limit is 1,000 lbs gw for both the pot and hook-and-line sectors.

Preferred Alternative 3. Modify the commercial fishing year for black sea bass to begin on January 1 and end on December 31. Black sea bass pots are prohibited from November 1 through April 30. From May 1 to October 31, the trip limit would be 1,000 lbs gw for pots. From May 1 to December 31, the trip limit would be 1,000 lbs gw for the hook-and-line sector and from January 1 to April 30, the hook-and-line sector would be restricted to a trip limit of:

Sub-alternative 3a. 100 lbs gw

Sub-alternative 3b. 200 lbs gw

Preferred Sub-alternative 3c. 300 lbs gw

Alternative 4. Modify the commercial fishing year for black sea bass to begin on May 1 and end on April 30. Black sea bass pots are prohibited from November 1 through April 30. The trip limit is 1,000 lbs gw for both the pot and hook-and-line sectors.

2.4.1 Comparison of Alternatives

The biological effects of the alternatives for **Action 4** would be similar to those for **Action 2**. AMs are in place to ensure ACLs are not exceeded and overfishing does not occur. Therefore, biological effects of the various alternatives would be related to fishing effort during the black sea bass spawning season, and possible incidental catch of black sea bass when harvest for co-occurring species is open, or vice-versa. Therefore, the most simplistic interpretation of the analyses would translate into **Alternative 1 (No Action)** being the most biologically beneficial among the alternatives proposed. However, there could be increased biological benefits from **Preferred Alternative 3** and **Alternative 4**, which would allow fishermen to retain incidentally caught black sea bass when using hook-and-line gear.

Alternative 1 (No Action), **Alternative 2**, and **Alternative 4** could have higher positive economic effects for hook-and-line fishermen after November 1 each year when compared to the more restrictive hook-and-line trip limits proposed in **Sub-alternatives 3a-3c (Preferred)**. **Preferred Alternative 3** and **Alternative 4** could have direct negative economic effects for the pot portion of the commercial sector depending on whether black sea bass north of Cape Hatteras, North Carolina remains open. If harvest for black sea bass north of Cape Hatteras is still open when the South Atlantic black sea bass pot sector is open, it could create a glut in the market and fishermen would likely receive a lower price for their fish.

The possible impacts on the black sea bass pot sector would primarily be associated with a closure due to right whale calving season. In recent years, the commercial sector has closed before the right whales

are in the South Atlantic region starting in November, but the increase in the black sea bass ACL could extend fishing into calving season. The prohibition on the use of black sea bass pots from November 1 to April 30, implemented through the Regulatory Amendment 19 (SAFMC 2013f) final rule, could negatively impact the pot sector if the commercial ACL is not met before November 1. Therefore, any alternative that would allow pot fishermen to land as much of the black sea bass commercial ACL before the right whale calving season would be beneficial. Under this scenario, **Alternative 4** would be more beneficial to the pot fishermen than **Alternative 1 (No Action)** or **Alternative 2**.

For the hook-and-line sector, there may be some benefit in removing pot effort through the right whale closure under **Preferred Alternative 3** and **Alternative 4**. **Preferred Alternative 3**, which has sub-options for varying trip limits, would also have varied social effects depending upon which trip limit is chosen.

Alternatives 2 and **4** would not add any new administrative burdens since a fishing season is already being monitored under **Alternative 1** (**No Action**). **Preferred Alternative 3** and its sub-alternatives would add to the administrative burden, with costs associated with additional monitoring and enforcement of the new trip limit(s), in addition to time spent on disseminating new information to the public.

2.5 Action 5. Modify the commercial fishing seasons for vermilion snapper

Preferred Alternative 1 (No Action). The commercial fishing year for vermilion snapper is split into two seasons of equal duration, each with its own ACL. The first season begins on January 1 and ends on June 30 (6 months). The second season begins on July 1 and ends on December 31 (6 months). The commercial ACL is split equally between the two seasons with a commercial trip limit of 1,000 lbs gw (1,110 lbs ww). When 75% of the commercial vermilion snapper ACL has been met or is projected to be met, the commercial trip limit is reduced to 500 lbs gw (555 lbs ww).

ABC/ACLs and commercial split season ACLs using the current fishing season for 2013-2016 based on the recent SEDAR assessment and the South Atlantic Council/SSC-approved ABC control rule.

Year	ABC ww	Total ACL ww	Comm ACL ww	Comm ACL Jan-June ww	Comm ACL July-Dec ww
2013	1,372,000	1,372,000	932,960	466,480	466,480
2014	1,312,000	1,312,000	892,160	446,080	446,080
2015	1,289,000	1,289,000	876,520	438,260	438,260
2016	1,269,000	1,269,000	862,920	431,460	431,460

Alternative 2. The commercial fishing year for vermilion snapper is split into two seasons, each with its own ACL. 100% of the new ACL implemented through Regulatory Amendment 18 is applied to the second season. The commercial trip limit is 1,000 lbs gw (1,110 lbs ww) and is reduced to 500 pounds gw (555 lbs ww) when 75% of the commercial vermilion snapper ACL has been met or is projected to be met.

Sub-alternative 2a. Second season start date remains at July 1.

Sub-alternative 2b. Second season start date begins on June 1.

Sub-alternative 2c. Second season start date begins on May 1.

ABC/ACLs and commercial split season ACLs using the current fishing season for 2013-2016 based on the recent SEDAR assessment and the South Atlantic Council/SSC-approved ABC control rule. 100% of increased ACL applied to second season. Previous total ACL was 653,045 lbs ww.

Year	ABC ww	Total ACL ww	Comm ACL ww	Season 1	Season2
2013	1,372,000	1,372,000	932,960	326,527	606,433
2014	1,312,000	1,312,000	892,160	326,527	565,633
2015	1,289,000	1,289,000	876,520	326,527	549,993
2016	1,269,000	1,269,000	862,920	326,527	536,393

Alternative 3. The commercial fishing year for vermilion snapper is split into two seasons, each with its own ACL. 25% of the new ACL implemented through Regulatory Amendment 18 is applied to the first season and 75% of the new ACL implemented through Regulatory Amendment 18 is applied to the second season. The commercial trip limit is 1,000 lbs gw (1,110 lbs ww) and is reduced to 500

pounds gw (555 lbs ww) when 75% of the commercial vermilion snapper ACL has been met or is projected to be met.

Sub-alternative 3a. Second season start date remains at July 1.
Sub-alternative 3b. Second season start date begins on June 1.
Sub-alternative 3c. Second season start date begins on May 1.

ABC/ACLs and commercial split season ACLs using the current fishing season for 2013-2016 based on the recent SEDAR assessment and the South Atlantic Council/SSC-approved ABC control rule. 25% of the increased ACL is applied to the first season and 75% of increased ACL applied to second season. Previous total ACL was 653,045 lbs ww.

Year	ABC ww	Total ACL ww	Comm ACL ww	Season 1	Season 2
2013	1,372,000	1,372,000	932,960	396,504*	536,457*
2014	1,312,000	1,312,000	892,160	386,304	505,857
2015	1,289,000	1,289,000	876,520	382,394	494,127
2016	1,269,000	1,269,000	862,920	378,994	483,927

*Season 1 + Season 2 ACLs do not equal the total commercial ACL due to rounding.

2.5.1 Comparison of Alternatives

The biological consequences of changing split season commercial ACLs, and modifying the start of the two commercial vermilion snapper fishing seasons under **Alternatives 2** and **3** (and their related sub-alternatives) are likely to be negligible, since overall harvest would be limited to the sector ACL and split-season ACLs. Furthermore, AMs would be triggered if the ACLs were exceeded. With the increased ACLs implemented through the final rule for Regulatory Amendment 18 (SAFMC 2013e), the issue of discards due to early seasonal closures is highly reduced. Additionally, quota-monitoring efforts have improved over the past year, which would reduce the risk of the commercial ACL being exceeded.

In terms of economic effects, Action 5 is largely a management decision as to when the fish are to be caught. Since the commercial ACL has been met each year, and assuming there are no significant seasonal price-per-pound fluctuations for vermilion snapper, there are no differences in the economic effects for when the seasons begin, or what percentage of the overall ACL goes to either season.

In general, the longer the season can stay open, the more benefits to the commercial fleet. Additionally, a vermilion snapper season that can be open at the same time as harvest for co-occurring species (such as black sea bass) can help reduce discards and improve efficiency of trips. Overall, it is difficult to assess whether there are substantial social effects with any of the alternatives. **Preferred Alternative 1 (No Action)** may offer more positive social effects from the point of stability in management. The other alternatives propose different season lengths, with **Alternative 2** and its sub-alternatives providing some of the longest second season lengths and **Alternative 3** and its sub-alternatives offering more of an even split between the seasons than **Alternative 2**, but shorter first seasons than **Preferred Alternative 1 (No Action)**.

None of the alternatives and their sub-alternatives considered under this action would result in additional administrative burdens in the form of cost, time, or law enforcement efforts.

2.6 Action 6. Modify the trip limit for the commercial sector for gag

Alternative 1 (No Action). The commercial trip limit for gag is 1,000 pounds gutted weight (lbs gw).

Preferred Alternative 2. Reduce the trip limit when 75% of the gag commercial ACL is landed.

Sub-alternative 2a. Reduce the trip limit to 100 lbs gw.

Sub-alternative 2b. Reduce the trip limit to 200 lbs gw.

Sub-alternative 2c. Reduce the trip limit to 300 lbs gw.

Sub-alternative 2d. Reduce the trip limit to 400 lbs gw.

Preferred Sub-alternative 2e. Reduce the trip limit to 500 lbs gw.

2.6.1 Comparison of Alternatives

The biological effects of **Alternatives 1 (No Action)** and **2** would be expected to be neutral because ACLs and AMs are in place to ensure overfishing does not occur. **Alternative 1 (No Action)** could present a greater biological risk to the gag stock in terms of exceeding the ACL than **Preferred Alternative 2**, since no step-down trip limit would be in place to slow down the rate of harvest and help ensure the ACL is not exceeded. However, improvements have been made to the quota monitoring system, and the South Atlantic Council has approved a Dealer Reporting Amendment, which should enhance data reporting. Furthermore, AMs are in place to ensure overfishing does not occur if the ACLs are exceeded. Trip limits specified under **Preferred Alternative 2** could provide biological benefits to the South Atlantic gag stock since the harvest would be reduced when landings were close to reaching the commercial ACL. This provision could help ensure that overages do not occur and could result in biological benefits. However, any biological benefits associated with **Preferred Alternative 2** are expected to be small.

Lengthening the season through trip limits is not likely to increase the ex-vessel price-per-pound received by fishermen unless the gag season can be extended into a period where no other similar snapper grouper species are available to buyers. Therefore, while **Alternative 1 (No Action)** is not expected to change the length of the commercial fishing season, it is expected to have the least direct negative economic effect on commercial snapper grouper fishermen. **Sub-alternatives 2a** through **2e (Preferred)**, in that order, would be expected to have the most to the least direct negative economic effect.

If the longest expected season results in greater social benefits, **Preferred Alternative 2, Sub-alternative 2a** would be the most beneficial to the commercial fleet in terms of lengthening the season. However, while trip limits may extend the length of the fishing season, this management measure would be expected to alter the profitability of some trips, jeopardizing normal fishing behavior, revenues, and social benefits. It is assumed for the purposes of this discussion that the greater the economic losses, the

greater the social losses. Social benefits would likely be maximized as a result of some trade-off between season length and economic changes.

Preferred Alternative 2 would have increased administrative burdens when compared with **Alternative 1** (**No Action**). Additional costs would be incurred due to monitoring and enforcement of the new trip limits, in addition to time and resources spent on disseminating new information to the public.

2.7 Action 7. Modify the recreational accountability measure for vermilion snapper

Alternative 1 (No Action). If recreational landings, as estimated by the SRD, reach or are projected to reach the recreational ACL and vermilion snapper are overfished, the AA will file a notification to close the recreational sector for the remainder of the fishing year. Without regard to overfished status, if vermilion snapper recreational landings exceed the ACL, the AA will file a notification at or near the beginning of the next fishing year, to reduce the ACL for that fishing year by the amount of the overage.

Alternative 2. If recreational landings, as estimated by the SRD, reach or are projected to reach the recreational ACL, the AA will file a notification to close the recreational sector for the remainder of the fishing year. If vermilion snapper recreational landings exceed the ACL, the AA will file a notification at or near the beginning of the next fishing year, to reduce the ACL for that fishing year by the amount of the overage.

Alternative 3. If recreational landings, as estimated by the SRD, reach or are projected to reach the recreational ACL the AA will file a notification to close the recreational sector for the remainder of the fishing year.

Preferred Alternative 4. If recreational landings, as estimated by the SRD, reach or are projected to reach the recreational ACL, the AA will file a notification to close the recreational sector for the remainder of the fishing year. Payback of a recreational overage would only take place if vermilion snapper are overfished and the total ACL is exceeded due to an overage in the recreational ACL. The amount of the overage would be deducted from the following year's recreational ACL.

2.7.1 Comparison of Alternatives

Alternative 1 (No Action) would be expected to yield the least biological benefit since it would not provide any in-season or post-season protection against overfishing. Vermilion snapper are not overfished and the in-season closure would only be in effect if the stock was overfished. **Alternative 2** is the most conservative of the alternatives since it includes both an in-season closure and a payback provision, and hence would yield the highest biological benefit. **Alternative 3** would provide an in-season closure but there would be no payback provision in the following fishing year if the ACL was exceeded. **Preferred Alternative 4** provides an in-season closure, but payback of an ACL overage would only go into effect if the species were overfished and the total ACL (commercial + recreational) was exceeded. Currently, there is no payback provision in place for the commercial sector. Payback of the amount of a recreational overage would include a deduction from the following year's recreational ACL. In terms of biological effects, **Alternative 2** and **Alternative 1 (No Action)** would be the most and least beneficial, respectively.

In the absence of estimates of mid-term and long-term effects on consumer surplus (CS) and net operating revenue (NOR), it is not possible to determine which alternative would provide the best net effects over time. It may only be noted that actual balancing of the mid-term and long-term effects on CS and NOR would partly depend on how fast management can react to the changing status of the stock. This, in turn, would partly depend on timely knowledge of the status of the stock.

In general, the most long-term benefits for the stock and for sustainable recreational fishing opportunities would result from a combination of an in-season closure and a payback provision. However, some flexibility in how these AMs are triggered can help to mitigate the negative short-term impacts on the recreational sector.

Alternatives 2 through **4 (Preferred)** fall within the scope and capacity of the current management system, which monitors ACLs and closes fisheries as ACLs are met. These alternatives are not expected to significantly affect the administrative environment.

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 and sea grass beds

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

  Examples include populations of groupers, corals, and turtles

- **Socio-economic 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

3.1.1 Inshore/Estuarine Habitat

Many snapper grouper species utilize both pelagic and benthic habitats during several stages of their life histories; larval stages of these species live in the water column and feed on plankton. Most juveniles and adults are demersal (bottom dwellers) and associate with hard structures on the continental shelf that have moderate to high relief (e.g., coral reef systems and artificial reef structures, rocky hard-bottom substrates, ledges and caves, sloping soft-bottom areas, and limestone outcroppings). Juvenile stages of some snapper grouper species also utilize inshore seagrass beds, mangrove estuaries, lagoons, oyster reefs, and embayment systems. In many species, various combinations of these habitats may be utilized during daytime feeding migrations or seasonal shifts in cross-shelf distributions. Additional information on the habitat utilized by species in the Snapper Grouper Complex is included in Volume II of the Fishery Ecosystem Plan (FEP; SAFMC 2009b) and incorporated here by reference. The FEP can be found at: http://www.safmc.net/ecosystem/Home/EcosystemHome/tabid/435/Default.aspx.

3.1.2 Offshore Habitat

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

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

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

Florida is relatively small compared to the whole shelf, this area, based upon landing information of fishers, constitutes prime reef fish habitat and probably significantly contributes to the total amount of reef habitat in this region.

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

The distribution of coral and live hard bottom habitat as presented in the Southeast Marine Assessment and Prediction Program (SEAMAP) bottom mapping project is a proxy for the distribution of the species within the snapper grouper complex. The method used to determine hard bottom habitat relied on the identification of reef obligate species including members of the snapper grouper complex. The Florida Fish and Wildlife Research Institute (FWRI), using the best available information on the distribution of hard bottom habitat in the South Atlantic region, prepared ArcView maps for the four-state project. These maps, which consolidate known distribution of coral, hard/live bottom, and artificial reefs as hard bottom, are available on the South Atlantic Fishery Management Council's (South Atlantic Council) online map services provided by the newly developed SAFMC Habitat and Ecosystem Atlas: http://ocean.floridamarine.org/safmc_atlas/. An introduction to the system is found at: http://www.safmc.net/EcosystemManagement/EcosystemBoundaries/MappingandGISData/tabid/632/Default.aspx .

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

3.1.3 Essential Fish Habitat

Essential fish habitat (EFH) is defined in the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) as "those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S. C. 1802(10)). Specific categories of EFH identified in the South Atlantic Bight, which are utilized by federally managed fish and invertebrate species, include both estuarine/inshore and marine/offshore areas. Specifically, estuarine/inshore EFH includes: Estuarine emergent and mangrove wetlands, submerged aquatic vegetation, oyster reefs and shell banks, intertidal flats, palustrine emergent and forested systems, aquatic beds, and estuarine water column. Additionally, marine/offshore EFH includes: live/hard bottom habitats, coral and coral reefs, artificial and manmade reefs, *Sargassum* species, and marine water column.

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

habitat and the additional pelagic environment, including *Sargassum*, required for survival of larvae and growth up to and including settlement. In addition, the Gulf Stream is also EFH because it provides a mechanism to disperse snapper grouper larvae.

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

3.1.4 Habitat Areas of Particular Concern

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

Areas that meet the criteria for EFH-HAPCs include habitats required during each life stage (including egg, larval, postlarval, juvenile, and adult stages).

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

Refer to **Appendix I** for detailed information on EFH and EFH-HAPCs for all Council managed species.

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 3.2.1**). Each component will be described in detail in the following sections.

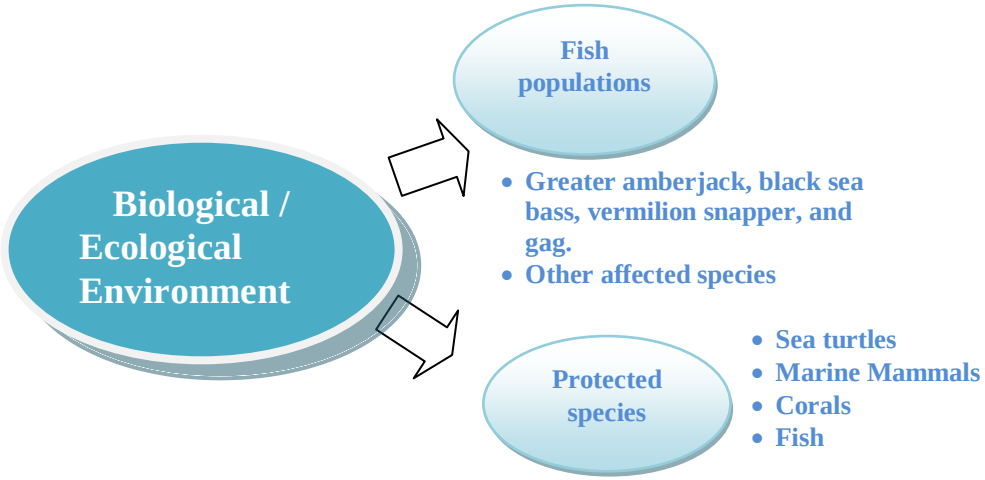

Figure 3.2.1. Two components of the biological environment described in this document.

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 (black sea bass, red porgy) while the tropical variety's core residence is in the waters off south Florida, Caribbean Islands, and northern South America (black grouper, mutton snapper).

These are reef-dwelling species that live amongst each other. These species rely on the reef environment for protection and food. There are several reef tracts that follow the southeastern coast. The fact that these fish populations congregate 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).

Greater amberjack

Greater amberjack, *Seriola dumerili*, is a pelagic (living in the open ocean) and epibenthic (living near the bottom) species that occurs in the Indo-West Pacific, and in the Western and Eastern Atlantic Oceans. In the Western Atlantic, it occurs as far north as Nova Scotia, Canada, southward to Brazil, including the Gulf of Mexico (Paxton et al. 1989, Manooch and Potts 1997a; Manooch and Potts 1997b; Harris et al.

2007). Greater amberjack are found at depths of 18-360 meters (60-1,181 feet) inhabiting deep reefs, rocky outcrops or wrecks and, occasionally, coastal bays (Manooch and Potts 1997b; Harris et al. 2007). Juveniles and adults occur singly or in schools in association with floating plants or debris in oceanic and offshore waters.

This species is the largest jack (Robins and Ray 1986). Maximum reported size is 190 centimeters (75 inches) and 80.6 kilograms (177.7 lbs) (Paxton et al. 1989). Size at maturity and age at 50% maturity for females is estimated as 73.3 centimeters (28.9.3 inches) total length (TL) and 1.3 years, respectively (Harris et al. 2007). Maximum reported age is 17 years (Manooch and Potts 1997a). Greater amberjack are gonochorists (separate sexes). Based on the occurrence of migratory nucleus oocytes and postovulatory follicles, spawning occurs from January through June, with peak spawning in April and May. Although fish in spawning condition were captured from North Carolina through the Florida Keys, spawning appears to occur primarily off south Florida and the Florida Keys (Harris et al. 2007). Greater amberjack in spawning condition were sampled from a range of depths, although the bulk of samples were from the shelf break. Tagging data indicate that greater amberjack are capable of extensive movement that might be related to spawning activity. Greater amberjack tagged off South Carolina have been recaptured off Georgia, east Florida, Florida Keys, west Florida, Cancun Mexico, Cuba, and the Bahamas (MARMAP, unpublished data). Primary food items include fishes, such as bigeye scad, and invertebrates (Paxton et al. 1989).

Stock Status of Greater Amberjack

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).

Greater amberjack was assessed through SEDAR 15 (2008). Since the early 1990s, landings were fairly equal between the commercial and recreational sectors. Discards of greater amberjack were relatively low. The estimated time series of fishing mortality rate (F) in SEDAR 15 (2008) showed a general increasing trend from the 1980s through the mid-1990s, and then a decline from the 1990s to 2006 (around F = 0.23).

Fishing mortality was compared to what the fishing mortality would be if the fishery were operating at maximum sustainable yield (F_{MSY}). This ratio (F/F_{MSY}) indicated that overfishing had not occurred over most of the assessment period, except in 1992, 1994, and 1999. Minimum size limits had increased the age at full selection and the fishing mortality had reduced the number of older fish, suggesting that current landings were being supported by only 2 to 4 year-classes in any given year. Total estimated stock abundance averaged 1.5 million fish and varied with a slightly decreasing trend. Abundance peaked with the strong 1986 year-class, and again in 2001. Estimated spawning stock biomass had gradually and steadily decreased over the assessment period.

SEDAR 15 (2008) indicated that the greater amberjack stock within US waters of the South Atlantic from Monroe County, Florida (including the Gulf of Mexico) through Massachusetts **was not undergoing overfishing and was not overfished** as of 2006 (last year of data in the stock assessment update).

Black Sea Bass

Black sea bass, *Centropristis striata*, occur in the Western Atlantic, from Maine to northeastern Florida, and in the eastern Gulf of Mexico. The species can be found in extreme south Florida during cold winters (Robins and Ray 1986). Separate populations were reported to exist to the north and south of Cape Hatteras, North Carolina (Wenner et al. 1986). However, genetic similarities suggest that this is one stock (McGovern et al. 2002). This species is common around rock jetties and on rocky bottoms in shallow water (Robins and Ray 1986) at depths from 2-120 m (7-394 ft). Most adults occur at depths from 20-60 m (66-197 ft) (Vaughan et al. 1995).

Maximum reported size is 66.0 cm (26.1 in) TL and 3.6 kg (7.9 lbs) (McGovern et al. 2002). The minimum size and age of maturity for females studied off the southeastern U.S. coast is 10 cm (3.6 in) standard length (SL) and age 0. All females are mature by 18 cm (7.1 in) SL and age 3 (McGovern et al. 2002). Wenner et al. (1986) reported that spawning occurs from March through May in the South Atlantic Bight. McGovern et al. (2002) indicated that black sea bass females are in spawning condition during March-July, with a peak during March through May (McGovern et al. 2002). Some spawning also occurs during September and November. Spawning takes place in the evening (McGovern et al. 2002). Black sea bass change sex from female to male (protogyny). McGovern et al. (2002) noted that the size at maturity and the size at transition of black sea bass was smaller in the 1990s than during the early 1980s. Black sea bass appear to compensate for the loss of larger males by changing sex at smaller sizes and younger ages.

In the eastern Gulf of Mexico and off North Carolina, female black sea bass dominate the first 5-year classes. Individuals over the age of 5 are more commonly males. Black sea bass live for at least 10 years. The diet of this species is generally composed of shrimp, crab, and fish (Sedberry 1988). Sedberry (1988) indicated that black sea bass consume primarily amphipods, decapods, and fishes off the Southeastern United States. Smaller black sea bass ate more small crustaceans and larger individuals fed more on decapods and fishes.

Stock Status of Black Sea Bass

An update to the black sea bass assessment (SEDAR 25 2011) was conducted in March 2013 with data through 2012 (SEDAR 25 2013). Most of the data sources were simply updated with the 2 additional years of observations available. The 2013 update to SEDAR 25 concluded that black sea bass are **not overfished** and **overfishing is not occurring**. The stock is very close to B_{MSY} (B_{2012}/B_{MSY}=0.96) and the Spawning Stock Biomass (SSB) in 2012 is just above SSB_{MSY} (SSB_{2012}/SSB_{MSY}=1.032). SSB in 2012 was estimated to be above $SSB_{MSY,}$ indicating that the stock is rebuilt. Spawning stock biomass decreased significantly from the beginning of the assessment period, dropping below SSB_{MSY} in 1989, until finally stabilizing and remaining at a low level from 1994-2007. The SSB has been increasing consistently since 2008, crossing SSB_{MSY} in the terminal year of the assessment. Current fishing mortality (F) is well below F_{MSY} ($F_{Current}/F_{MSY}$=0.659). The trend in F shows a rapid increase from the late 1970s until 1988, when it surpassed F_{MSY} by a significant amount. F remained above F_{MSY}, with large inter-annual variability, until it dropped below F_{MSY} in 2011.

Vermilion Snapper

Vermilion snapper, *Rhomboplites aurorubens*, occur in the Western Atlantic, from North Carolina to Rio de Janeiro. The species is most abundant off the southeastern United States and in the Gulf of Campeche (Hood and Johnson 1999). The vermilion snapper is demersal (bottom-dwelling), commonly found over rock, ledges, live-bottom, gravel, or sand bottoms near the edge of the continental and island shelves (Froese and Pauly 2003). It occurs at depths from 18 to 122 meters (59 to 400 feet), but is most abundant at depths less than 76 meters (250 feet). Individuals often form large schools. This fish is not believed to exhibit extensive long range or local movement (SEDAR 2 2003).

The maximum size of a male vermilion snapper, reported by Allen (1985), was 60.0 centimeters (23.8 inches) TL and 3.2 kilograms (7.1 pounds). Maximum reported age in the South Atlantic Bight was 14 years (Zhao et al. 1997; Potts et al. 1998a). This species spawns in aggregations (Lindeman et al. 2000) from April through late September in the southeastern United States (Cuellar et al. 1996). Zhao et al. (1997) indicated that most spawning in the South Atlantic Bight occurs from June through August. Eggs and larvae are pelagic.

Vermilion snapper are gonochorists, meaning that males and females do not change sex during their lifetime. All vermilion snapper are mature at 2 years of age and 20 centimeters (7.9 inches) (SEDAR 2 2003). Cuellar et al. (1996) collected vermilion snapper off the southeastern United States and found that all were mature. The smallest female was 16.5 centimeters (6.5 inches) fork length (FL) and the smallest male was 17.9 centimeters (7.1 inches) FL. Zhao and McGovern (1997) reported that 100% of males that were collected after 1982 along the southeastern United States were mature at 14 centimeters (5.6 inches) TL and age 1. All females collected after 1988 were mature at 18 centimeters (7.1 inches) TL and age 1.

This species preys on fishes, shrimp, crabs, polychaetes, and other benthic invertebrates, as well as cephalopods and planktonic organisms (Allen 1985). Sedberry and Cuellar (1993) reported that small crustaceans (especially copepods), sergestid decapods, barnacle larvae, stomatopods, and decapods dominated the diets of small (< 50 millimeters (2 inches) SL) vermilion snapper off the southeastern United States. Larger decapods, fishes, and cephalopods are more important in the diet of larger vermilion snapper.

Stock Status of Vermilion Snapper

An update to the vermilion snapper assessment was conducted in 2012 with data through 2011 (SEDAR 17 Update 2012). Most of the data sources were simply updated with the 4 additional years of observations available since the SEDAR 17 (SEDAR 17 2008) benchmark. This update to SEDAR 17 showed that vermilion snapper are **not overfished** and **overfishing is not occurring**. The stock is very close to B_{MSY} (94.3% of B_{MSY}) and the SSB is also very close to SSB_{MSY} (98.1% of SSB_{MSY}). Current fishing mortality (F) is well below F_{MSY} (76.9% of F_{MSY}). The trend in F showed a rapid increase from the mid-1980s until 1991, when it surpassed F_{MSY} by a significant amount. However, the South Atlantic Council implemented a size limit in 1992 causing F to decrease below F_{MSY}, where it has remained ever since. Stock biomass showed a significant decrease over the assessment period. This trend is expected in a fishery being harvested at exploitation rates approaching the MSY-level. Further, it is expected that the stock will decrease to around B_{MSY}, if exploitation stays at the desired level, slightly below F_{MSY}, at which point it will stabilize and hover around that value as long as overfishing is not occurring. Evidence in some model outputs suggested that the stock is reaching such equilibrium. For instance, landings have varied around MSY much of the recent past and recruitment is hovering around R_{MSY} (recruitment when

the population is at B_{MSY}). These diagnostics suggested that the stock is being sustainably harvested and that the stock is approaching an equilibrium condition.

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 occur at depths of 39-152 m (131-498 ft) (Heemstra and Randall 1993) and prefer 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 that 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. 1998b). 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 cm (41.6 in) TL, 50% of fishes are males, while almost all gag are males at sizes greater than 120 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 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

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** 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 was **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.

3.2.2 Other Species Affected

Species that co-occur with the species considered in this amendment are:
Red porgy, *Pagrus pagrus*
Red snapper, *Lutjanus campechanus*
Red grouper, *Epinephelus morio*
Black grouper, *Epinephelus nigritus*
Almaco jack, *Seriola rivoliana*
Banded rudderfish, *Seriola zonata*
Scamp, *Mycteroperca phenax*
White grunt, *Haemulon plumieri*
Tomtate, *Haemulon aurolineatum*
Jolthead porgy, *Calamus bajonado*
Knobbed porgy, *Calamus nodosus*
Mutton snapper, *Lutjanus analis*
Lane snapper, *Lutjanus synagris*
Gray snapper, *Lutjanus griseus*
Yellowtail snapper, *Ocyurus chrysurus*

For details on the life histories and ecology of co-occurring species, the reader is referred to Volume II of the Fishery Ecosystem Plan (SAFMC 2009b) available at:
http://www.safmc.net/ecosystem/Home/EcosystemHome/tabid/435/Default.aspx.

3.2.3 The Stock Assessment Process

Greater amberjack, black sea bass, vermilion snapper, and gag 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 Scientific and Statistical Committee (SSC). The SSC considers whether the assessment represents the best available science and develops fishing level recommendations for South Atlantic Council consideration.

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

3.2.4 Protected Species

There are 44 species protected by federal law that may occur in the exclusive economic zone (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). Six of these marine mammal species 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 turtles (green, hawksbill, Kemp's ridley, leatherback, and loggerhead); the smalltooth sawfish; five distinct population segments of Atlantic sturgeon; and elkhorn coral (*Acropora palmata*) and staghorn coral (*A. cervicornis*) ("*Acropora*" collectively) are also protected under the ESA. Portions of designated critical habitat for North Atlantic right whales and *Acropora* also occur within the South Atlantic Council's jurisdiction. The species potentially affected by the hook-and-line portion of the fishery are discussed below.

3.2.4.1 ESA-Listed Sea Turtles

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

Green sea turtle hatchlings are thought to occupy pelagic areas of the open ocean and are often associated with *Sargassum* rafts (Carr 1987, Walker 1994). Pelagic stage green sea turtles are thought to be carnivorous. Stomach samples of these animals found ctenophores and pelagic snails (Frick 1976, Hughes 1974). At approximately 20 to 25 cm carapace length, juveniles migrate from pelagic habitats to benthic foraging areas (Bjorndal 1997). As juveniles move into benthic foraging areas a diet shift towards herbivory occurs. They consume primarily seagrasses and algae, but are also know to consume jellyfish, salps, and sponges (Bjorndal 1980, 1997; Paredes 1969; Mortimer 1981, 1982). The diving abilities of all sea turtles species vary by their life stages. The maximum diving range of green sea turtles is estimated at 110 m (360 ft) (Frick 1976), but they are most frequently making dives of less than 20 m (65 ft.) (Walker 1994). The time of these dives also varies by life stage. The maximum dive length is estimated at 66 minutes with most dives lasting from 9 to 23 minutes (Walker 1994).

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

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

Leatherbacks are the most pelagic of all ESA-listed sea turtles and spend most of their time in the open ocean. Although they will enter coastal waters and are seen over the continental shelf on a seasonal

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

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

3.2.4.2 ESA-Listed Marine Fish

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

3.3 Socio-economic Environment

3.3.1 Economic Description of the Commercial Sector

Additional information on the commercial snapper grouper sector is contained in previous amendments [Amendment 13C (SAFMC 2006), Amendment 15A (SAFMC 2008a), Amendment 15B (SAFMC 2008b), Amendment 16 (SAFMC 2009a), Regulatory Amendment 9 (SAFMC 2011a), and Comprehensive ACL Amendment for the South Atlantic Region (SAFMC 2011c)] and is incorporated

herein by reference. Presented below is selected information on the commercial sector with focus on the four key species in this amendment.

The major source of commercial landings data summarized in this description is the Federal Logbook System (FLS), supplemented by average prices calculated from the Accumulated Landings System (ALS). Landings data from the FLS could be lower than those of the ALS. The database was provided by the Southeast Fisheries Science Center (L. Perruso, personal communication, 2013). Landings are expressed in whole weight after converting gutted weight to whole weight using the appropriate conversion factor for each of the four key species.

Presented in **Tables 3.3.1** through **3.3.3** is selected information for trips that landed at least one pound of each of the four key species, namely, black sea bass, gag, greater amberjack, and vermilion snapper. The information consists of trips, vessels, pounds (lbs), revenues from each species, and total revenues. "Trips" refers to the number of trips taken by all vessels with South Atlantic snapper grouper permits that landed at least one pound of the subject species. "Vessels" refer to the number of vessels that undertook trips that landed at least one pound of the subject species. "Dealers" refers to the number of dealers that purchased the subject species. "Days" refers to the number of days the vessel was away from port. "Lbs" refers to the pounds in whole weight of the subject species landed. "Rev (fish)" refers to the ex-vessel revenues from the sale of the subject species (fish). "Total Rev" refers to the total ex-vessel revenues from all species caught and landed in the same trips that caught and landed the subject species. Information for each species pertains only to the subject species and may include landings of other species, so the numbers in the tables, e.g., trips and vessels, are not additive across species.

3.3.1.1 Annual Landings, Revenues, and Effort

Annual landings, revenues, and effort for all four key species are summarized on a calendar year basis.

From 2008 through 2012, an average of 1,473 trips that landed at least one pound of black sea bass was taken by 223 permitted vessels, and 102 dealers were engaged in purchasing black sea bass (**Table 3.3.1**). These trips landed 438,000 lbs ww of black sea bass with an ex-vessel value of about $918,000. These trips also caught other species, and the total revenues from all species, including black sea bass, were about $3.6 million. Revenues are in real terms, i.e., adjusted for inflation. Similar interpretation may be made of the numbers for the other species.

There is no discernible trend in any of the trip characteristics for each species over the 2008-2012 period. On average, trips that landed at least one pound of vermilion snapper generated the highest revenues ($2.9 million) among the subject species and also the highest total revenues ($6.2 million) from all species caught in the same trips as the subject species. On the other end, trips that landed at least one pound of greater amberjack generated the lowest revenues ($905,000) from the subject species, but trips that landed at least one pound of black sea bass recorded the lowest total revenues ($3.6 million) from all species caught in the same trips as the subject species. Although not shown in the table, it can be readily calculated that, on average, gag had the highest price per pound at $3.98 while greater amberjack had the lowest at $1.05 per pound.

North Carolina accounted for the highest landings of black sea bass, gag, and vermilion snapper while Florida recorded the highest landings of greater amberjack (**Table 3.3.2**). Except for gag, the states that accounted for the highest landings also recorded the highest revenues from the species. For gag, North

Carolina had the highest landings but South Carolina brought in the highest revenues. The highest total revenues matched with the highest landings only for black sea bass (North Carolina) and greater amberjack (Florida). For gag and vermilion snapper, South Carolina had the highest total revenues although North Carolina had the highest landings for these species.

Table 3.3.1. Selected characteristics for trips landing at least one pound (ww) of four snapper grouper species in the South Atlantic, 2008-2012.

	2008	2009	2010	2011	2012	Average
Black Sea Bass						
Trips	1,915	2,352	1,345	673	1,082	1,473
Vessels	259	280	213	179	184	223
Dealers	116	112	107	82	94	102
Lbs (ww)	439	635	462	357	295	438
Rev (BSB)	$989	$1,388	$988	$622	$601	$918
Rev (Total)	$5,017	$5,682	$3,506	$1,561	$2,471	$3,647
Gag						
Trips	2,223	2,367	2,124	2,120	1,632	2,093
Vessels	294	292	243	233	196	252
Dealers	137	130	132	128	112	128
Lbs (ww)	457	451	443	437	352	428
Rev (Gag)	$1,812	$1,740	$1,731	$1,851	$1,385	$1,704
Rev (Total)	$7,224	$6,441	$5,392	$5,581	$3,975	$5,717
Greater Amberjack						
Trips	2,192	2,515	2,370	2,331	1,788	2,239
Vessels	346	385	300	269	218	304
Dealers	127	129	119	115	113	121
Lbs (ww)	721	853	983	954	813	865
Rev (GA)	$782	$856	$1,012	$1,013	$862	$905
Rev (Total)	$6,619	$6,178	$5,933	$5,695	$3,956	$5,676
Vermilion Snapper						
Trips	2,863	2,055	1,208	1,306	1,246	1,736
Vessels	317	261	205	187	176	229
Dealers	145	115	95	94	89	108
Lbs (ww)	1,205	913	936	967	885	981
Rev (Ver)	$3,722	$2,623	$2,745	$2,941	$2,656	$2,937
Rev (Total)	$10,137	$7,108	$4,601	$4,903	$4,202	$6,190

Note: Pounds are in thousands whole weight and revenues are in 2011 thousand dollars.
Source: NMFS SEFSC Coastal Fisheries Logbook and Accumulated Landings Data Systems, personal communication, Larry Perruso (2013).

Table 3.3.2. Selected average characteristics for trips landing at least one pound (ww) of four snapper grouper species in the South Atlantic, by state, 2008-2012 average.

	Florida	Georgia	South Carolina	North Carolina
Black Sea Bass				
Trips	248	32	340	853
Vessels	29	2	18	46
Days	495	193	1,464	1,619
Lbs (ww)	58	1	126	252
Rev (BSB)	$92	$2	$262	$556
Rev (Total)	$556	$184	$1,250	$1,625
Gag				
Trips	662	29	445	957
Vessels	54	2	17	36
Days	1,171	170	2,599	2,131
Lbs (ww)	123	7	141	157
Rev (Gag)	$483	$29	$614	$577
Rev (Total)	$1,356	$169	$2,172	$1,999
Greater Amberjack				
Trips	1,439	49	356	395
Vessels	83	2	14	39
Days	2,287	275	2,420	1,134
Lbs (ww)	710	13	83	59
Rev (GA)	$757	$13	$81	$56
Rev (Total)	$2,283	$254	$2,097	$1,025
Vermilion Snapper				
Trips	428	54	456	797
Vessels	42	2	18	37
Days	1,171	324	2,588	2,294
Lbs (ww)	274	66	282	359
Rev (Ver)	$797	$192	$856	$1,091
Rev (Total)	$1,420	$330	$2,209	$2,194

Note: Pounds are in thousands whole weight and revenues are in 2011 thousand dollars.
Source: NMFS SEFSC Coastal Fisheries Logbook and Accumulated Landings Data Systems, personal communication, Larry Perruso (2013).

3.3.1.2 Average Monthly Landings, Revenues, and Effort

On a month-to-month basis, peak revenues from the species matched exactly with peak landings for all the four species (**Table 3.3.3**). Peak revenues and landings occurred in June for black sea bass, May for gag and greater amberjack, and September for vermilion snapper. Peaks for total revenues coincided with peak landings for gag and greater amberjack. For black sea bass and vermilion snapper, peaks for total revenues occurred in September while peak landings occurred in June for black sea bass and September for vermilion snapper.

The number of trips per month did not necessarily come from the most number of vessels that landed some of the four key species in this amendment. For example, the number of trips landing gag occurred in July but the highest number of vessels that landed the species occurred in May. The same can be said about the relationship between the number of trips and the pounds landed. For vermilion snapper, for

example, the highest number of trips occurred in August while the highest landings of the species occurred in September.

Table 3.3.3. Selected monthly characteristics for trips landing at least one pound (ww) of four snapper grouper species in the South Atlantic, 2008-2012 average.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Black Sea Bass												
Trips	84	68	51	67	63	242	263	221	161	85	85	83
Vessels	30	30	23	29	30	50	53	49	45	32	33	31
Days	182	152	146	172	198	597	744	580	420	215	196	170
Lbs	38	29	16	10	6	87	62	54	36	22	25	52
Rev (BSB)	$88	$63	$35	$23	$13	$162	$128	$114	$76	$44	$51	$115
Rev (Total)	$192	$129	$104	$140	$191	$550	$701	$583	$447	$194	$187	$197
Gag												
Trips	70	86	2	6	351	299	264	263	215	222	167	147
Vessels	30	36	2	5	64	56	52	52	48	48	45	43
Days	210	243	7	20	981	873	803	766	619	630	500	421
Lbs	17	19	0	1	77	61	46	37	39	51	41	38
Rev (Gag)	$64	$75	$1	$3	$311	$242	$184	$147	$156	$199	$165	$155
Rev (Total)	$207	$218	$3	$15	$913	$802	$766	$761	$653	$550	$428	$381
Greater Amberjack												
Trips	162	174	222	10	419	235	192	201	182	166	144	131
Vessels	49	46	44	8	71	61	51	50	45	47	48	39
Days	490	492	417	20	823	629	635	648	522	527	508	405
Lbs	55	65	140	1	220	61	47	61	63	60	47	45
Rev (GA)	$58	$68	$153	$1	$226	$61	$50	$63	$64	$65	$50	$47
Rev (Total)	$478	$424	$349	$11	$778	$546	$610	$655	$548	$461	$436	$362
Vermilion Snapper												
Trips	195	166	86	88	133	138	270	272	236	57	49	44
Vessels	43	40	32	38	41	44	53	51	49	30	27	25
Days	697	678	357	324	489	469	1,024	991	817	207	179	145
Lbs	153	97	40	39	54	43	152	158	171	32	24	19
Rev (Ver)	$470	$306	$118	$121	$158	$123	$441	$470	$509	$98	$68	$55
Rev (Total)	$716	$542	$243	$277	$485	$426	$984	$999	$904	$236	$182	$158

Note: Pounds are in thousands whole weight and revenues are in 2011 thousand dollars.
Source: NMFS SEFSC Coastal Fisheries Logbook and Accumulated Landings Data Base Systems, personal communication, Larry Perruso (2013).

3.3.1.3 Average Landings, Revenues, and Effort by Gear Type

Hook-and-line was the dominant gear in the harvest of three of the four snapper grouper species affected by this amendment (**Table 3.3.4**). The only exception is black sea bass for which traps (diving/traps) were the dominant gear. The dominant gear types in terms of landings were also dominant in terms of revenues generated from the species.

There were more vessels and trips harvesting any of the four snapper grouper species that used hook-and-line. Longline gear was not particularly important in the harvest of any of the four snapper grouper species.

Table 3.3.4. Selected characteristics for trips landing at least one pound (ww) of four snapper grouper species in the South Atlantic, by gear, 2008-2012 average.

	Hook-and-line	Longline	Diving/Traps	Others
Black Sea Bass				
Trips	951	14	421	87
Vessels	75	2	19	27
Days	2,961	27	640	143
Lbs	64	1	370	3
Rev (BSB)	$133	$1	$771	$6
Rev (Total)	$2,582	$63	$819	$151
Gag				
Trips	1,649	2	220	223
Vessels	86	1	20	33
Days	5,326	5	342	398
Lbs	323	0	43	62
Rev (Gag)	$1,284	$0	$176	$242
Rev (Total)	$4,800	$5	$422	$468
Greater Amberjack				
Trips	1,923	8	72	237
Vessels	111	3	11	44
Days	5,534	29	148	406
Lbs	781	3	14	549
Rev (GA)	$820	$3	$15	$69
Rev (Total)	$5,001	$55	$202	$400
Vermilion Snapper				
Trips	1,621	2	22	90
Vessels	89	1	3	21
Days	6,083	12	66	217
Lbs	971	1	2	7
Rev (Ver)	$2,907	$2	$7	$20
Rev (Total)	$5,799	$17	$100	$238

Note: Pounds are in thousands whole weight and revenues are in 2011 thousand dollars.
Source: NMFS SEFSC Coastal Fisheries Logbook and Accumulated Landings Data Base Systems, personal communication, Larry Perruso (2013).

3.3.1.4 Permits

A commercial permit is required to harvest or possess commercial quantities of snapper grouper from the EEZ. There are two types of commercial snapper grouper permits—unlimited permits and non-transferable trip-limited permits. An unlimited permit is a transferable permit (subject to restrictions) that allows unlimited harvest of snapper grouper species (subject to trip limits or seasonal restrictions). A non-transferable trip-limited permit limits the owner to 225 lbs of snapper grouper harvest per trip. Both types of permits are limited access permits.

The numbers of commercial snapper grouper permits from 2008 through 2012 are provided in **Table 3.3.5**. According to the Southeast Regional Office Website, the Constituency Services Branch (Permits) unofficially listed 121 trip-limited snapper grouper permit holders and 566 unlimited snapper grouper permit holders as of May17, 2013.

The total number of permits steadily declined from 2008 through 2012. This decline in total permits came from the decline of both the unlimited and limited permits. It may also be noted that every year from 2008 through 2012, the number of vessels landing at least one pound of any of the four key species in this amendment was lower than the number of snapper grouper permits (**Table 3.3.5** and **Table 3.3.1**). This is partly a result of regulations affecting the harvest of the four key species in this amendment.

Table 3.3.5. Number of South Atlantic commercial snapper grouper permits.

	Unlimited	Limited 225 lbs	Total
2008	665	151	816
2009	640	144	784
2010	624	139	763
2011	569	126	695
2012	558	123	681
Average	611	137	748

Source: NMFS SERO Permits Data Base, 2013.

3.3.2 Economic Description of the Recreational Sector

Additional information on the recreational sector of the snapper grouper fishery is contained in previous or concurrent amendments and is incorporated herein by reference [see 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 11 (SAFMC 2011b), Comprehensive ACL Amendment for the South Atlantic Region (SAFMC 2011c), and Amendment 24 (SAFMC 2011d)]. The following description focuses mainly on the recreational sector for the four key species in this amendment, namely, black sea bass, gag, greater amberjack, and vermilion snapper.

The recreational fishery is comprised of the private sector and the for-hire sector. The private sector includes anglers fishing from shore (all land-based structures) and private/rental boats. The for-hire sector is composed of the charter boat and headboat (also called partyboat) sectors. Charter boats generally carry fewer passengers and charge a fee on an entire vessel basis, whereas headboats carry more passengers and payment is per person.

3.3.2.1 Landings

A few notes are in order before discussing the landings data presented in **Tables 3.3.6** through **3.3.9**. First, landings of the four species are summarized on a calendar year basis. Second, black sea bass landings exclude landings north of Cape Hatteras, NC for consistency with the stock definition from SEDAR 25. Third, gag landings include landings from Monroe County, FL for consistency with the stock definition from SEDAR 10. Fourth, greater amberjack landings include landings from Monroe County, FL for consistency with the stock definition in SEDAR 15.

There appears to be no perceptible pattern in the year-to-year fluctuations in harvest of the key species in this amendment, except for vermilion snapper, which showed a steady decline throughout 2008-2012 (**Table 3.3.6**). Harvest of black sea bass increased in 2009 and 2010 but fell in the next two years. Harvest of gag fell in 2009 through 2011 but slightly recovered in 2012. Harvest of greater amberjack rose in 2009, fell slightly in 2010, further fell substantially in 2011, but recovered in 2012.

There appears to be only a few observable patterns in recreational landings over the years across the various states and species (**Table 3.3.7**). Landings followed a seesaw pattern for black sea bass and gag in South Carolina. Florida and South Carolina reported declining harvests of gag and vermilion snapper, respectively, over the 2008-2012 period. However, North and South Carolina were not too far behind Florida in the harvest of black sea bass and vermilion snapper.

The absence of a perceptible trend is also true for harvest of the four species across the various fishing modes (**Table 3.3.8**). The only exception would be the harvest of vermilion snapper by headboats. In this case, harvest steadily declined throughout the 2008-2012 period.

Except for vermilion snapper, the private mode was the dominant segment in the harvest of the subject species (**Table 3.3.8**). The headboat segment dominated in the harvest of vermilion snapper. The second dominant fishing modes were headboat in the harvest of black sea bass, the private mode in the harvest of vermilion snapper, and the charter mode in the harvest of gag and greater amberjack.

Peak harvests by all fishing modes generally occurred in wave 3 for all four species (**Table 3.3.8**). The only exceptions were headboat harvests of black sea bass, which peaked in wave 4, and charter mode harvests of vermilion snapper, which also peaked in wave 4.

With few exceptions, harvests by each state mostly peaked in wave 3 for all species (**Table 3.3.9**). These exceptions would be the harvest of black sea bass in Florida, the harvest of greater amberjack in South Carolina, and the harvest of vermilion snapper in Georgia. For all these species, peak landings occurred in wave 4. Another exception would be the harvest of gag in South Carolina, which peaked in wave 6.

Table 3.3.6. Harvest (pounds whole weight) of four species in the South Atlantic, by mode, calendar year 2008-2012.

	2008	2009	2010	2011	2012	Average
Black Sea Bass						
Charter	40,027	85,204	141,797	102,319	54,501	84,770
Headboat	99,310	163,169	289,233	232,567	128,367	182,529
Private	321,028	221,540	445,047	273,804	332,100	318,704
Shore	1,054	2,670	5,835	705	2,790	2,611
TOTAL	461,418	472,583	881,911	609,395	517,759	588,613
Gag						
Charter	45,038	55,799	28,721	18,723	26,908	35,038
Headboat	39,106	31,556	32,366	30,116	19,904	30,610
Private	646,602	354,912	119,460	115,058	142,974	275,801
Shore	5,558	5,605	0	0	0	2,233
TOTAL	736,304	447,872	180,547	163,897	189,786	343,681
Greater Amberjack						
Charter	675,107	621,572	504,720	171,646	353,458	465,300
Headboat	75,027	89,215	74,697	36,161	44,931	64,006
Private	612,578	665,611	703,565	165,082	359,818	501,331
Shore	0	0		19,723	0	4,931
TOTAL	1,362,712	1,376,398	1,282,982	392,612	758,207	1,034,582
Vermilion Snapper						
Charter	71,538	93,527	55,498	22,666	34,193	55,484
Headboat	301,175	261,107	169,859	151,075	147,059	206,055
Private	160,620	144,049	39,308	46,025	33,445	84,689
Shore	0	0	0	0	0	0
TOTAL	533,333	498,683	264,665	219,765	214,697	346,229

Source: SEFSC MRIP ACL database, NMFS, SERO.

Table 3.3.7. Harvest (pounds whole weight) of four species in the South Atlantic, by state, calendar year, 2008-2012.

	2008	2009	2010	2011	2012	Average
Black Sea Bass						
Florida	122,270	185,855	267,262	270,693	136,835	196,583
Georgia	99,817	33,829	30,204	63,422	21,756	49,806
N. Carolina	98,472	161,440	232,496	137,692	159,992	158,018
S. Carolina	140,859	91,460	351,949	137,588	199,175	184,206
TOTAL	461,418	472,583	881,911	609,395	517,759	588,613
Gag						
Florida	590,747	246,405	92,583	89,627	78,405	219,553
Georgia	31,906	1,380	8,245	1,445	848	8,765
N. Carolina	104,373	181,186	63,772	48,182	102,858	100,074
S. Carolina	9,277	18,901	15,947	24,643	7,676	15,289
TOTAL	736,304	447,872	180,547	163,897	189,786	343,681
Greater Amberjack						
Florida	873,573	790,047	816,027	257,383	568,439	661,094
Georgia	32,172	32,167	19,950	781	3,599	17,734
N. Carolina	390,730	486,727	392,425	121,937	167,236	311,811
S. Carolina	66,237	67,457	54,581	12,510	18,933	43,944
TOTAL	1,362,712	1,376,398	1,282,982	392,612	758,207	1,034,582
Vermilion Snapper						
Florida	154,430	211,135	77,070	76,356	67,977	117,394
Georgia	22,831	22,366	3,494	12,097	4,062	12,970
N. Carolina	152,670	133,090	99,968	65,999	87,300	107,805
S. Carolina	203,402	132,092	84,133	65,314	55,358	108,060
TOTAL	533,333	498,683	264,665	219,765	214,697	346,229

Source: SEFSC MRIP ACL database, NMFS, SERO.

Table 3.3.8. Average harvest (pounds whole weight) of four species in the South Atlantic, by mode and wave, calendar year 2008-2012.

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6
Black Sea Bass						
Charter	200	4,784	44,453	26,240	7,247	1,846
Headboat	8,594	19,533	58,973	60,525	24,602	10,303
Private	36,992	63,825	80,536	63,755	39,838	33,758
Shore	0	850	1,085	154	244	278
Gag						
Charter	7,858	2,342	12,457	9,087	2,496	798
Headboat	1,936	2,516	9,888	6,795	6,162	3,312
Private	40,880	41,676	76,482	43,638	49,264	23,861
Shore	0	1,112	0	1,121	0	0
Greater Amberjack						
Charter	32,732	96,720	170,741	103,671	39,580	21,857
Headboat	1,965	4,589	23,677	21,692	9,034	3,049
Private	24,790	54,523	219,985	103,140	38,078	60,815
Shore	0	0	0	0	3,945	0
Vermilion Snapper						
Charter	5,555	2,092	16,931	19,133	10,073	1,700
Headboat	4,640	25,986	73,779	62,345	36,116	3,190
Private	12,546	13,043	18,068	16,520	12,571	11,941
Shore	0	0	0	0	0	0

Wave 1: Jan-Feb; Wave 2: Mar-Apr; Wave 3: May-Jun; Wave 4: Jul-Aug; Wave 5: Sep-Oct; Wave 6: Nov-Dec
Source: SEFSC MRIP ACL database, NMFS, SERO.

Table 3.3.9. Average harvest (pounds whole weight) of four species in the South Atlantic, by state and wave, calendar year 2008-2012.

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6
Black Sea Bass						
Florida	24,683	23,524	45,632	58,128	26,007	18,610
Georgia	95	10,609	20,947	9,301	1,793	7,061
N. Carolina	20,645	7,557	65,938	40,569	16,483	6,826
S. Carolina	362	47,302	52,529	42,677	27,648	13,688
Gag						
Florida	28,076	35,637	60,370	31,661	41,278	22,531
Georgia	0	54	8,111	367	197	35
N. Carolina	22,582	11,642	27,604	24,451	13,126	669
S. Carolina	16	311	2,742	4,162	3,322	4,736
Greater Amberjack						
Florida	56,376	133,316	237,840	95,178	60,909	77,475
Georgia	0	1,230	8,411	3,712	3,241	1,139
N. Carolina	3,038	20,344	155,094	106,605	20,917	5,814
S. Carolina	73	941	13,059	23,007	5,570	1,294
Vermilion Snapper						
Florida	20,644	21,175	25,639	23,530	20,076	6,329
Georgia	1	1,622	4,249	4,572	1,649	877
N. Carolina	1,581	8,014	40,731	35,862	20,114	1,504
S. Carolina	515	10,310	38,159	34,035	16,921	8,120

Wave 1: Jan-Feb; Wave 2: Mar-Apr; Wave 3: May-Jun; Wave 4: Jul-Aug; Wave 5: Sep-Oct; Wave 6: Nov-Dec
Source: SEFSC MRIP ACL database, NMFS, SERO.

3.3.2.2 Effort

Recreational effort can be characterized in terms of the number of trips as follows:

1. Target effort - The number of individual angler trips, regardless of trip duration, where the intercepted angler indicated that the species 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 trip duration and target intent, where the individual species was caught. The fish caught did not have to be kept.
3. All recreational trips - The total estimated number of recreational trips taken, regardless of target intent or catch success.

Estimates of target effort for the four key species in this amendment are presented in **Table 3.3.10** through **Table 3.3.13** and those for catch effort are presented in **Table 3.3.14** through **Table 3.3.17**. Clearly apparent in these tables is the substantial difference between target and catch trips, with catch trips being higher than target trips. This has generally been the case with most snapper grouper species in the South Atlantic.

On average, target trips for black sea bass (39,175 trips) and gag (34,127 trips) appear to be relatively high (**Table 3.3.10**). There were 4,026 target trips for vermilion snapper and 5,522 target trips for greater amberjack. The private mode was the dominant fishing mode for trips targeting all four snapper grouper species. Targeting by the shore mode anglers was very low, except probably for black seas bass.

Target trips for all modes combined appear to follow certain patterns (**Table 3.3.10**). Target trips for gag steadily declined throughout the 2008-2012 period while target trips for all other species followed a seesaw pattern. The seesaw pattern, however, did not exactly match for all species. Target trips for black sea bass and greater amberjack started with a negative change in 2009, whereas target trips for vermilion snapper started with a positive change in 2009.

Targeting for black sea bass in all four South Atlantic states appear to be relatively high, but targeting for other species mostly came from one or two states (**Table 3.3.11**). South Carolina was the dominant state in trips targeting black sea bass, followed closely by North Carolina, and then by Florida and Georgia. Florida was by far the major source of trips targeting greater amberjack and vermilion snapper. Target trips in Georgia were very low, and in fact, this state's target trips were only for black sea bass and gag. The pattern of changes in target trips for all four species followed exactly that of the dominant state.

There is no apparent trend in target trips by wave for the four species across fishing modes (**Table 3.3.12**). Peaks for target trips occurred in wave 3 for black sea bass, wave 4 for gag and greater amberjack, and wave 2 for vermilion snapper. Peaks for target trips by the private mode, the dominant mode in targeting each species, occurred in wave 3 for black sea bass and greater amberjack, wave 4 for gag, and wave 2 for vermilion snapper.

There is also no apparent trend in target trips by wave for the four species across the various states (**Table 3.3.13**). Target trips for black sea bass peaked in wave 4 for Florida, wave 2 for Georgia, and wave 3 for North and South Carolina. Target trips in Florida, the dominant state in targeting the other three species, peaked in wave 4 for gag and greater amberjack and wave 2 for vermilion snapper.

In contrast to target trips, catch trips for all species were relatively high (**Table 3.3.14**). Catch trips for black sea bass were particularly high for all modes. Just as was the case with target trips, the private mode dominated all other modes in terms of catch trips for all four species. Catch trips by the shore mode were also relatively high even exceeding those of the charter mode for such species as black sea bass and gag. Unlike target trips, catch trips followed no apparent pattern for any of the four species for all modes combined or across the various modes (**Table 3.3.14**).

Catch trips for most of the four species were relatively high in all four states, with certain exceptions (**Table 3.3.15**). Catch trips in Georgia were relatively low for gag and greater amberjack. As was the case with target trips, Florida dominated catch trips for all species, except black sea bass. As noted earlier, South Carolina had the most number of target trips for black sea bass, followed closely by North Carolina, Florida, and Georgia (**Table 3.3.11**). In terms of catch trips, on the other hand, North Carolina had the most catch trips, followed closely by Florida, South Carolina, and Georgia. The pattern of changes in total catch trips for all four species followed exactly that of the dominant state, except in the case of vermilion snapper where changes in Florida catch trips and total catch trips went in the opposite direction in 2011 and 2012.

There is no apparent trend in catch trips by wave for the four species across fishing modes (**Table 3.3.16**). Peaks for catch trips occurred in wave 4 for black sea bass, wave 5 for gag, and wave 3 for greater amberjack and vermilion snapper. Peaks for catch trips by the private mode, the dominant mode in catching each of the four species, occurred in wave 4 for black sea bass, wave 5 for gag, wave 3 for greater amberjack, and wave 2 for vermilion snapper.

There is also no apparent trend in catch trips by wave for the four species across the various states (**Table 3.3.17**). Catch trips for black sea bass peaked in wave 4 for Florida, North Carolina, and South Carolina, and wave 3 for Georgia. Catch trips in Florida, the dominant state in catching the other three species, peaked in wave 6 for gag, wave 3 for greater amberjack, and wave 2 for vermilion snapper.

Table 3.3.10. Target trips for four species in the South Atlantic, by mode, 2008-2012.

	2008	2009	2010	2011	2012	Average
Black Sea Bass						
Charter	1,632	1,469	2,917	732	191	1,388
Private	38,750	19,319	48,184	36,102	40,730	36,617
Shore	4,621	0	404	648	175	1,170
TOTAL	45,003	20,788	51,505	37,482	41,096	39,175
Gag						
Charter	1,118	0	0	0	0	224
Private	71,653	31,590	26,380	24,000	12,862	33,297
Shore	709	1,542	0	0	779	606
TOTAL	73,480	33,132	26,380	24,000	13,641	34,127
Greater Amberjack						
Charter	1,589	1,671	3,753	338	1,739	1,818
Private	5,665	494	4,578	1,128	6,655	3,704
Shore	0	0	0	0	0	0
TOTAL	7,254	2,165	8,331	1,466	8,394	5,522
Vermilion Snapper						
Charter	577	241	384	0	0	240
Private	1,406	5,582	2,234	9,209	499	3,786
Shore	0	0	0	0	0	0
TOTAL	1,983	5,823	2,618	9,209	499	4,026

Source: MRIP database, NMFS, SERO.

Table 3.3.11. Target trips for four species in the South Atlantic, by state, 2008-2012.

	2008	2009	2010	2011	2012	Average
Black Sea Bass						
Florida	10,925	3,370	11,080	9,756	6,952	8,417
Georgia	9,261	1,204	2,069	4,546	1,069	3,630
N. Carolina	5,994	9,980	19,629	14,555	13,250	12,682
S. Carolina	18,823	6,234	18,727	8,625	19,825	14,447
TOTAL	45,003	20,788	51,505	37,482	41,096	39,175
Gag						
Florida	69,968	33,132	26,380	22,193	11,916	32,718
Georgia	0	0	0	1,457	0	291
N. Carolina	1,400	0	0	350	1,725	695
S. Carolina	2,112	0	0	0	0	422
TOTAL	73,480	33,132	26,380	24,000	13,641	34,127
Greater Amberjack						
Florida	7,202	1,645	7,275	1,374	8,394	5,178
Georgia	0	0	0	0	0	0
N. Carolina	0	494	922	92	0	302
S. Carolina	52	26	134	0	0	42
TOTAL	7,254	2,165	8,331	1,466	8,394	5,522
Vermilion Snapper						
Florida	1,603	5,582	2,234	7,647	499	3,513
Georgia	0	0	0	0	0	0
N. Carolina	0	0	100	0	0	20
S. Carolina	380	241	284	1,562	0	493
TOTAL	1,983	5,823	2,618	9,209	499	4,026

Source: MRIP database, NMFS, SERO.

Table 3.3.12. Average target trips for four species in the South Atlantic, by mode and wave, 2008-2012.

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6
Black Sea Bass						
Charter	48	186	457	528	166	3
Private	3,369	5,629	10,489	7,887	4,923	4,320
Shore	35	528	0	607	0	0
TOTAL	3,452	6,343	10,946	9,022	5,089	4,323
Gag						
Charter	0	104	55	0	64	0
Private	2,362	4,793	6,259	9,702	4,151	6,029
Shore	308	142	156	0	0	0
TOTAL	2,670	5,039	6,470	9,702	4,215	6,029
Greater Amberjack						
Charter	172	799	114	727	7	0
Private	737	469	1,505	993	0	0
Shore	0	0	0	0	0	0
TOTAL	909	1,268	1,619	1,720	7	0
Vermilion Snapper						
Charter	39	30	94	45	31	0
Private	609	2,127	263	786	0	0
Shore	0	0	0	0	0	0
TOTAL	649	2,157	358	831	31	0

Wave 1: Jan-Feb; Wave 2: Mar-Apr; Wave 3: May-Jun; Wave 4: Jul-Aug; Wave 5: Sep-Oct; Wave 6: Nov-Dec
Source: MRIP database, NMFS, SERO.

Table 3.3.13. Average target trips for four species in the South Atlantic, by state and wave, 2008-2012.

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6
Black Sea Bass						
Florida	2,052	873	1,642	2,005	725	1,119
Georgia	0	1,773	466	897	347	147
N. Carolina	1,400	1,093	4,010	3,964	1,273	941
S. Carolina	0	2,604	4,828	2,155	2,744	2,117
Gag						
Florida	2,670	5,039	6,470	8,428	4,081	6,029
Georgia	0	0	0	291	0	0
N. Carolina	0	0	0	625	70	0
S. Carolina	0	0	0	358	64	0
Greater Amberjack						
Florida	905	1,263	1,496	1,508	7	0
Georgia	0	0	0	0	0	0
N. Carolina	4	0	112	185	0	0
S. Carolina	0	5	10	27	0	0
Vermilion Snapper						
Florida	649	1,815	263	786	0	0
Georgia	0	0	0	0	0	0
N. Carolina	0	0	0	0	20	0
S. Carolina	0	342	94	45	11	0

Wave 1: Jan-Feb; Wave 2: Mar-Apr; Wave 3: May-Jun; Wave 4: Jul-Aug; Wave 5: Sep-Oct; Wave 6: Nov-Dec
Source: MRIP database, NMFS, SERO.

Table 3.3.14. Catch trips for four species in the South Atlantic, by mode, 2008-2012.

	2008	2009	2010	2011	2012	Average
Black Sea Bass						
Charter	18,677	25,745	30,987	28,725	32,618	27,350
Private	470,494	351,672	405,362	478,644	631,489	467,532
Shore	88,290	99,334	79,555	123,848	111,772	100,560
TOTAL	577,461	476,751	515,904	631,217	775,879	595,442
Gag						
Charter	3,745	9,197	2,527	1,448	2,590	3,901
Private	133,076	77,118	60,305	34,271	44,791	69,912
Shore	8,545	6,577	2,241	8,277	6,869	6,502
TOTAL	145,366	92,892	65,073	43,996	54,250	80,315
Greater Amberjack						
Charter	10,611	13,292	12,003	3,260	6,285	9,090
Private	51,930	41,057	19,146	11,549	18,792	28,495
Shore	832	660	0	2,379	2,383	1,251
TOTAL	63,373	55,009	31,149	17,188	27,460	38,836
Vermilion Snapper						
Charter	14,166	11,225	10,880	3,827	5,303	9,080
Private	76,651	60,694	18,777	17,207	18,561	38,378
Shore	0	0	0	1,972	0	394
TOTAL	90,817	71,919	29,657	23,006	23,864	47,853

Source: MRIP database, NMFS, SERO.

Table 3.3.15. Catch trips for four species in the South Atlantic, by state, 2008-2012.

	2008	2009	2010	2011	2012	Average
Black Sea Bass						
Florida	170,264	173,745	179,496	259,733	243,430	205,334
Georgia	89,539	39,380	44,226	52,818	46,339	54,460
N. Carolina	158,342	169,127	206,935	217,178	345,389	219,394
S. Carolina	159,316	94,499	85,247	101,488	140,721	116,254
TOTAL	577,461	476,751	515,904	631,217	775,879	595,442
Gag						
Florida	113,259	70,912	50,431	34,171	35,058	60,766
Georgia	4,497	124	780	106	125	1,126
N. Carolina	23,048	17,734	12,389	8,047	16,582	15,560
S. Carolina	4,562	4,122	1,473	1,672	2,485	2,863
TOTAL	145,366	92,892	65,073	43,996	54,250	80,315
Greater Amberjack						
Florida	41,362	35,936	18,235	13,648	22,432	26,323
Georgia	5,938	1,599	552	91	52	1,646
N. Carolina	14,446	12,585	9,863	3,449	4,976	9,064
S. Carolina	1,627	4,889	2,499	0	0	1,803
TOTAL	63,373	55,009	31,149	17,188	27,460	38,836
Vermilion Snapper						
Florida	64,870	53,575	13,496	16,488	14,323	32,550
Georgia	1,534	4,914	3,124	2,036	630	2,448
N. Carolina	9,019	7,272	6,744	2,627	4,406	6,014
S. Carolina	15,394	6,158	6,293	1,855	4,505	6,841
TOTAL	90,817	71,919	29,657	23,006	23,864	47,853

Source: MRIP database, NMFS, SERO.

Table 3.3.16. Average catch trips for four species in the South Atlantic, by mode and wave, 2008-2012.

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6
Black Sea Bass						
Charter	542	4,033	8,783	9,560	3,187	1,246
Private	27,553	58,681	118,904	123,813	88,783	49,798
Shore	2,032	13,884	26,456	31,304	17,340	9,544
TOTAL	30,127	76,599	154,143	164,677	109,309	60,587
Gag						
Charter	330	256	1,166	1,827	276	47
Private	9,267	10,387	12,589	10,130	14,148	13,392
Shore	476	145	1,050	1,890	2,496	445
TOTAL	10,074	10,787	14,805	13,847	16,919	13,883
Greater Amberjack						
Charter	559	1,334	3,330	2,269	1,335	263
Private	2,583	4,652	9,101	7,108	2,469	2,581
Shore	166	0	132	280	196	477
TOTAL	3,309	5,986	12,563	9,657	4,000	3,321
Vermilion Snapper						
Charter	309	761	2,612	2,922	1,951	526
Private	6,571	8,067	7,179	6,246	5,019	5,295
Shore	0	0	0	0	0	394
TOTAL	6,880	8,828	9,791	9,168	6,970	6,215

Wave 1: Jan-Feb; Wave 2: Mar-Apr; Wave 3: May-Jun; Wave 4: Jul-Aug; Wave 5: Sep-Oct; Wave 6: Nov-Dec
Source: MRIP database, NMFS, SERO.

Table 3.3.17. Average catch trips for four species in the South Atlantic, by state and wave, 2008-2012.

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6
Black Sea Bass						
Florida	26,891	36,895	42,264	42,407	28,801	28,076
Georgia	0	11,674	18,705	12,119	6,237	5,726
N. Carolina	3,237	15,376	60,151	75,841	52,337	12,452
S. Carolina	0	12,653	33,023	34,311	21,935	14,332
Gag						
Florida	8,237	8,997	10,992	8,622	10,875	13,043
Georgia	0	7	831	114	77	98
N. Carolina	1,837	1,481	2,726	4,297	4,979	241
S. Carolina	0	302	257	815	988	501
Greater Amberjack						
Florida	3,217	5,131	7,109	5,371	2,473	3,021
Georgia	0	216	1,242	103	53	33
N. Carolina	91	622	3,867	2,954	1,367	163
S. Carolina	0	18	345	1,229	107	104
Vermilion Snapper						
Florida	6,512	7,502	5,014	4,485	4,884	4,153
Georgia	0	540	317	1,278	223	91
N. Carolina	368	170	2,133	1,882	870	591
S. Carolina	0	616	2,328	1,523	994	1,380

Wave 1: Jan-Feb; Wave 2: Mar-Apr; Wave 3: May-Jun; Wave 4: Jul-Aug; Wave 5: Sep-Oct; Wave 6: Nov-Dec
Source: MRIP database, NMFS, SERO.

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. **Table 3.3.18** displays the annual angler days by state for 2008-2012 and **Table 3.3.19** displays their average (2008-2012) monthly distribution. Confidentiality issues required combining Georgia estimates with those of Northeast Florida.

Headboat angler days (trips) varied from year to year across various states. Total headboat angler trips increased in 2009, fell in the next two years, and increased in 2012 (**Table 3.3.18**). Southeast Florida registered the highest number of angler trips, followed by South Carolina, North Carolina and Georgia/Northeast Florida. Clearly, Florida dominated all other states in terms of headboat angler days.

On average (2008-2012), overall angler days peaked in July and troughed in November (**Table 3.3.19**). All states recorded peak angler trips in July, similar to the overall peak month. None of the states, however, had the same trough month as the overall angler trips. North Carolina had a trough in February, South Carolina and Georgia/Northeast Florida in January, and Southeast Florida in October.

Table 3.3.18. South Atlantic headboat angler days, by state, 2008-2012.

	2008	2009	2010	2011	2012	AVERAGE
NC	16,982	19,468	21,071	18,457	20,766	19,349
SC	47,287	40,919	44,951	44,645	41,003	43,761
GA/NEFL	52,521	66,447	53,676	46,256	8,800	12,822
SEFL	71,598	69,973	69,986	77,785	130,823	116,751
TOTAL	188,388	196,807	189,684	187,143	201,392	192,683

Source: The Headboat Survey, NOAA Fisheries, SEFSC, Beaufort Lab.

Table 3.3.19. Average monthly distribution of headboat angler days in the South Atlantic, by state, 2008-2012.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
NC	26	12	224	1,142	2,372	3,908	4,331	3,478	1,851	1,659	321	23
SC	70	196	1,234	3,203	3,897	9,363	11,614	8,118	3,093	2,236	618	118
GA/NEFL	158	357	734	1,344	1,631	2,389	2,459	1,478	894	662	403	312
SEFL	7,927	9,732	12,911	12,934	10,985	13,239	14,868	10,035	5,385	5,141	5,662	7,930
TOTAL	8,181	10,298	15,103	18,624	18,885	28,900	33,272	23,109	11,224	9,698	7,004	8,384

Source: The Headboat Survey, NOAA Fisheries, SEFSC, Beaufort Lab.

3.3.2.3 Permits

For-hire vessels are required to have a for-hire snapper grouper permit to fish for or possess snapper grouper species in the South Atlantic EEZ. The number of vessels with for-hire snapper grouper permits for the period 2008-2012 is provided in **Table 3.3.20**. This sector operates as an open access fishery and not all permitted vessels are necessarily active in the fishery. Some vessel owners may have obtained open access permits as insurance for uncertainties in the fisheries in which they currently operate.

The number of for-hire permits issued for the South Atlantic snapper grouper fishery decreased from 1,805 permits in 2008 to 1,797 permits in 2012. It was only in 2009 and 2012 that for-hire snapper grouper permits increased during this period. The majority of snapper grouper for-hire permitted vessels were home-ported in Florida; a relatively high proportion of these permitted vessels were also home-

ported in North Carolina and South Carolina. Many vessels with South Atlantic for-hire snapper grouper permits were home-ported in states outside of the South Atlantic Council's area of jurisdiction, particularly in the Gulf states of Alabama through Texas. The number of vessels with South Atlantic for-hire snapper grouper permits home-ported in states outside of South Atlantic Council's area of jurisdiction has accounted for about the same proportion (10-11%) of the total number of permits.

Table 3.3.20. Number of South Atlantic for-hire snapper grouper permits, by homeport state, 2008-2012.

Home Port	2008	2009	2010	2011	2012	Average
North Carolina	338	349	331	330	312	332
South Carolina	139	146	145	132	138	140
Georgia	26	30	27	26	26	27
Florida	1,121	1,131	1,109	1,099	1,122	1,116
Gulf (AL-TX)	76	83	86	91	93	86
Others	105	113	114	103	106	108
TOTAL	1,805	1,852	1,812	1,781	1,797	1,809

Source: NMFS SERO Permits Data Base, 2013.

For-hire permits do not distinguish charter boats 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 2013, the estimated number of headboats supplying for-hire services in all South Atlantic fisheries had fallen to 75, indicating a decrease in fleet size of approximately 22% between 1997 and 2013 (K. Brennan, Beaufort Laboratory, SEFSC, personal communication, 2013).

According to the Southeast Regional Office Website, the Constituency Services Branch (Permits) unofficially listed 1,491 current holders of South Atlantic for-hire snapper grouper permits as of May 17, 2013. There are no specific permitting requirements for recreational anglers to harvest snapper grouper. Instead, anglers are required to possess either a state recreational fishing permit that authorizes saltwater fishing in general, or be registered in the federal National Saltwater Angler Registry system, subject to appropriate exemptions

3.3.2.4 Economic Values and For-Hire Vessel Financials

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

The NMFS Southeast Science Center (Carter and Liese 2012) developed estimates of consumer surplus per fish, per angler trip. These estimates were culled from various studies – Haab et al. (2009), Dumas et al. (2009), and NOAA SEFSC SSRG (2009). The values/ranges of consumer surplus estimates are (in 2011 dollars) $117 to $134 for red snapper, $129 to $134 for grouper, $11.50 for other snappers, and $84 for snapper grouper. Haab et al. (2009) also estimated consumer surplus for snapper in general to range from $12 to $33 (2011 dollars) for one additional fish caught and kept. This latter number would be more relevant for purposes of the current amendment.

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 (PS) 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 revenues are available (C. Liese, 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). Estimates of net operating revenue per angler trip (2011 dollars) on representative charter trips (average charter trip regardless of area fished) are $153 for Louisiana through east Florida, $142 for east Florida, $164 for northeast Florida, and $134 for North Carolina. For charter trips into the EEZ only, net operating revenues are $148 in east Florida and $155 in northeast Florida. For full-day and overnight trips only, net operating revenues are estimated to be $163-$168 in North Carolina. Comparable estimates are not available for Georgia or South Carolina.

Net operating revenues per angler trip are lower for headboats than for charter boats. Net operating revenue estimates (2011 dollars) for a representative headboat trip are $50.30 in the Gulf of Mexico (all states and all of Florida), and $66-$71 in North Carolina. For full-day and overnight headboat trips, net operating revenues are estimated to be $78-$81 in North Carolina. Comparable estimates are not available for Georgia or South Carolina.

A study of the North Carolina for-hire fishery provides some information on the financial status of the for-hire fishery in the state (Dumas et al. 2009). Depending on vessel length, regional location, and season, charter fees per passenger per trip ranged from $176.30 to $263.80 for a full-day trip and from $98.20 to $130 for a half-day trip; headboat fees ranged from $76 to $85.70 for a full-day trip and from $39.90 to $42.20 for a half-day trip. Charter boats generated a total of $58.4 million in passenger fees, $3.4 million in other vessel income (e.g., food and beverages), and $5 million in tips. The corresponding figures for headboats were $10.3 million in passenger fees, $0.21 million in other vessel income, and $0.94 million in tips. Non-labor expenditures (e.g., boat insurance, dockage fees, bait, ice, fuel) amounted to $45 million for charter boats and $5.6 million for headboats. Summing across vessel lengths and regions, charter vessels had an aggregate value (depreciated) of $126.20 million and headboats had an aggregate value (depreciated) of $10.70 million. All these values are in 2011 dollars.

A more recent study of the for-hire sector provides estimates on gross revenues generated by the charter boats and headboats in the South Atlantic (Holland et al. 2012). Average annual revenues (2011 dollars) for charter boats are estimated to be $126,032 for Florida vessels, $53,443 for Georgia vessels, $100,823 for South Carolina vessels, and $101,959 for North Carolina vessels. For headboats, the corresponding estimates are $209,507 for Florida vessels and $153,848 for vessels in the other states. Due to limited sample size, revenue information for headboats in states other than Florida is aggregated to avoid disclosure of sensitive information.

3.3.3 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 Annual Catch Limit Amendment (SAFMC 2011c) and are incorporated herein by reference.

Since 2003, South Atlantic Snapper Grouper Unlimited Permits and Snapper Grouper 225-Pound Trip Limit Permits have shown a downward trend (**Figure 3.3.1**).

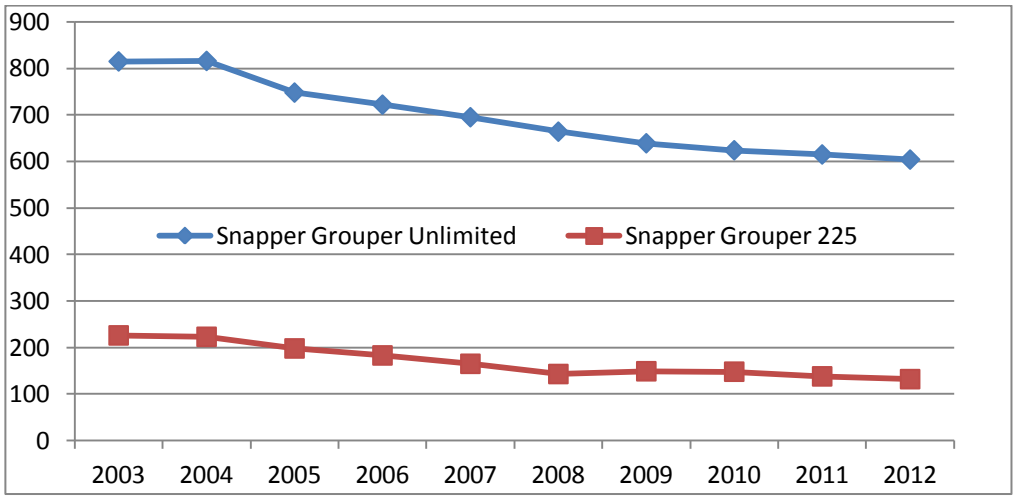

Figure 3.3.1. Snapper grouper Unlimited and 225-pound trip limit permits 2003-2012. Source: NMFS SERO (2013).

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), Amendment 17A (SAFMC 2010a) and the Comprehensive Annual Catch Limit Amendment (SAFMC 2011c).

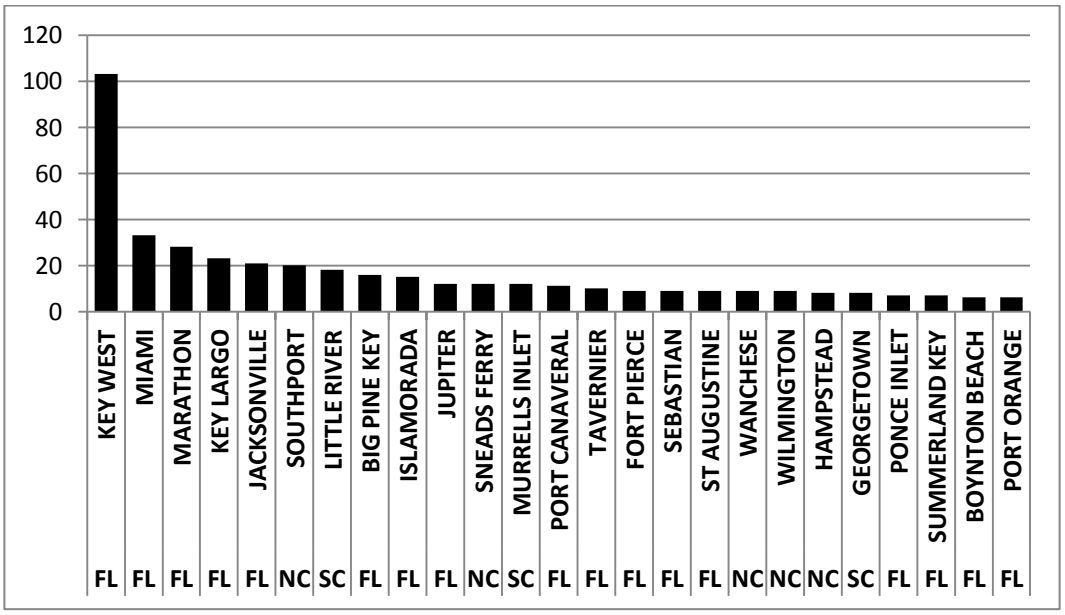

Figure 3.3.2. Snapper grouper unlimited permit (class 1) frequency by homeport. Source: NMFS SERO (2012).

Florida communities have the majority of snapper grouper unlimited permits (class 1) with the only communities outside of Florida being Southport, NC, and Little River, SC, within the top ten communities

(Figure 3.3.2). Florida also dominates trip-limited snapper grouper permits, or class 2 permits, with Hatteras, NC, the only community outside of the state listed in the top twenty communities with class 2 permits **(Figure 3.3.3).**

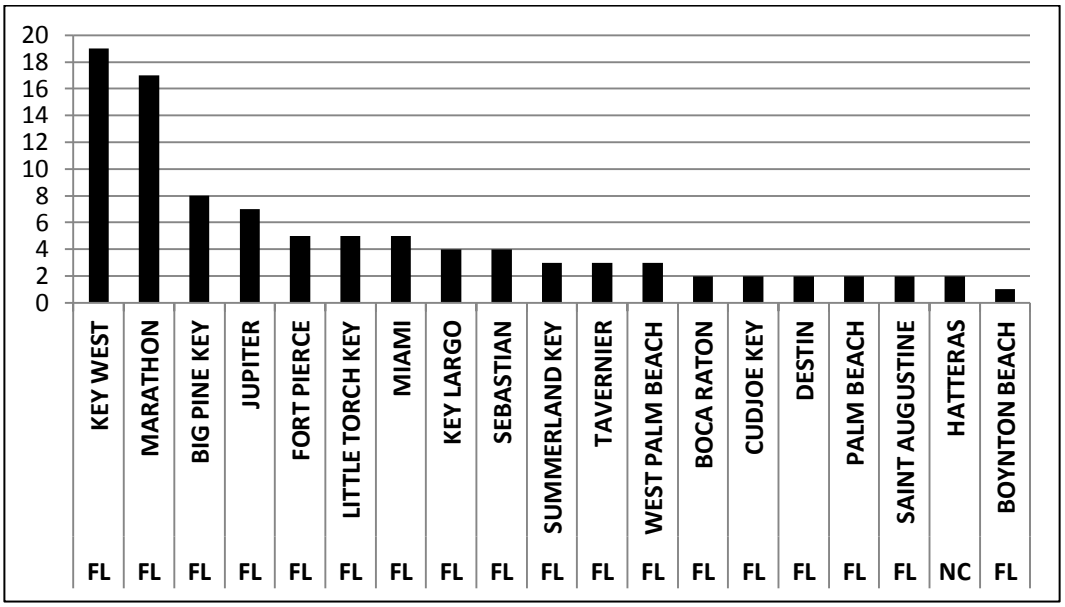

Figure 3.3.3. Snapper grouper 225-pound trip limit permits (class 2) frequency by homeport
Source: NMFS SERO (2011).

While the limited entry program has contributed to the reduced capacity, other factors have also contributed to this downward trend. Economic factors like increased imports, decreasing prices for domestic product, and rising prices for diesel fuel have had a widespread effect on commercial fishing throughout many regions of the U.S. In addition, the loss of working waterfronts has contributed to a growing loss of fishing infrastructure that may play a role in the decline in many fishing communities (Garrity-Blake and Nash 2012; Griffith 2011). For North Carolina, the losses have been substantial as over a decade there has been a 36% decline in the number of fish houses (Garrity-Blake and Nash 2012).

The factors that affect the loss of working waterfronts in fishing communities are coastal development, rising property taxes, decreasing access to waterfront due to increasing privatization of public resources, rising cost of dockage and fuel, lack of maintenance of waterways and ocean passages, competition with imported fish, and other less tangible (often political) factors. These, along with increasingly strict regulations, have combined to place a great deal of stress on many communities and their associated fishing sectors including commercial, charter/headboat, and private recreational.

While some of the same social factors above have affected the for-hire fishery in terms of loss of working waterfronts, other issues such as a downturn in the economy and competition have affected the growth of that sector. The recreational fishery has also been subjected to permit requirements in the for-hire sector as vessels in the South Atlantic are required to have a snapper grouper for-hire permit to fish for or possess snapper grouper species in the EEZ.

The number of for-hire permits issued in the South Atlantic snapper grouper fishery increased over the period 2003-2007 from 1,477 permits in 2003 to 1,754 permits in 2007. Increases occurred for those vessels that were strictly for-hire businesses, since permits issued for vessels operating as for-hire and

commercial entities were flat from 2005 to 2006 and fell in 2007. Today there are approximately 1,448 snapper grouper charter permits in effect (SERO Permits 2013). Most of these for-hire permitted vessels were home-ported in Florida, with vessels also home-ported in North Carolina and South Carolina.

While studies on the general identification of fishing communities have been undertaken in the past few years, little social or cultural investigation into the nature of the snapper grouper fishery itself has occurred. A socioeconomic study by Waters et al. (1997) covered the general characteristics of the fishery in the South Atlantic, but those data are now over 10 years old and do not capture more recent important changes in the fishery. Cheuvront and Neal (2004) conducted survey work with the North Carolina commercial snapper grouper fishery south of Cape Hatteras, but did not include ethnographic research on communities dependent upon fishing.

Communities with substantial landings of snapper grouper species were identified in Amendment 17A (SAFMC 2010a) and the Comprehensive Annual Catch Limits Amendment (SAFMC 2011c) with demographic descriptions for many of those communities included.

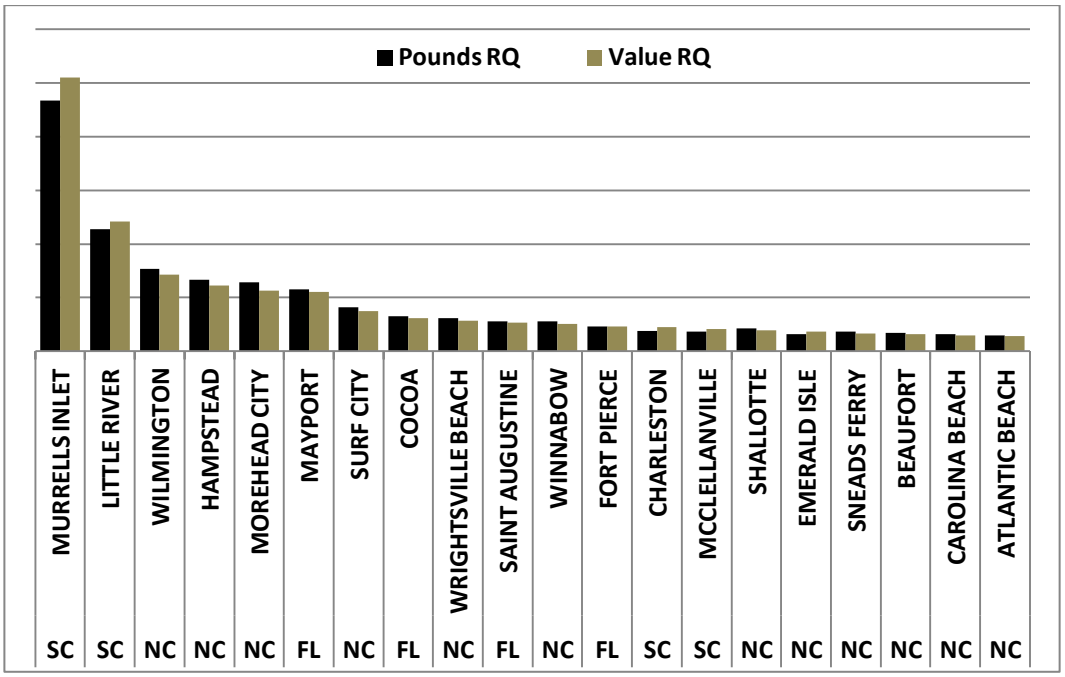

Figure 3.3.4. Regional quotient of pound and value for gag by community in 2011
Source: NMFS SERO (2013).

For actions affecting the gag component of the snapper grouper fishery, **Figure 3.3.4** provides a ranking of communities based upon their regional quotient (Rq) of gag landings. A regional quotient is the amount of local landings and/or value divided by the total landings and value for the region. For this analysis, total landings for gag in the 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. Values for regional quotient of pounds and value are not reported to address confidentiality concerns, yet they offer a good perspective on those communities that land a good proportion of a particular species. In **Figure 3.3.4** most gag is landed in South and North Carolina, with Murrells Inlet having the highest regional quotient.

Vermilion snapper is also an important species in Murrells Inlet and Little River, South Carolina; however Mayport, Florida has the highest regional quotient for this species (**Figure 3.3.5**). St. Augustine is the only other Florida community within the top ten for regional quotient; all other communities are in either in South or North Carolina.

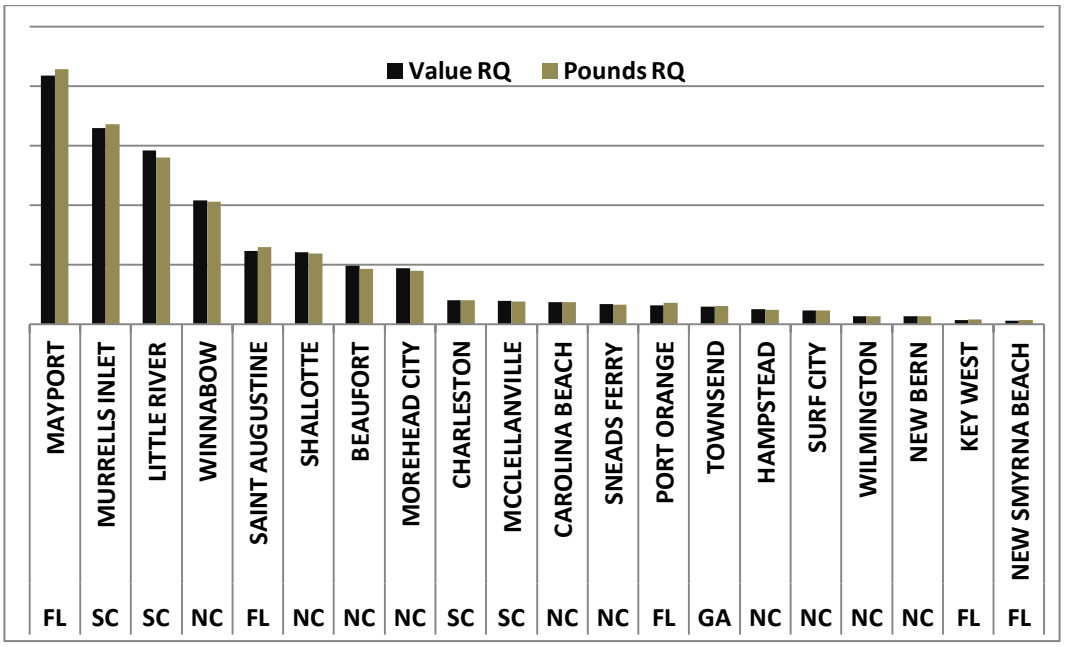

Figure 3.3.5. Regional quotient of pound and value for vermilion snapper by community in 2011
Source: NMFS SERO (2013).

The highest regional quotient for black sea bass is in Sneads Ferry, North Carolina (**Figure 3.3.6**). Most black sea bass is landed in either North or South Carolina, but Port Orange, Florida shows a high regional quotient for black sea bass landings, although its regional quotient for value is lower than the top two North Carolina communities.

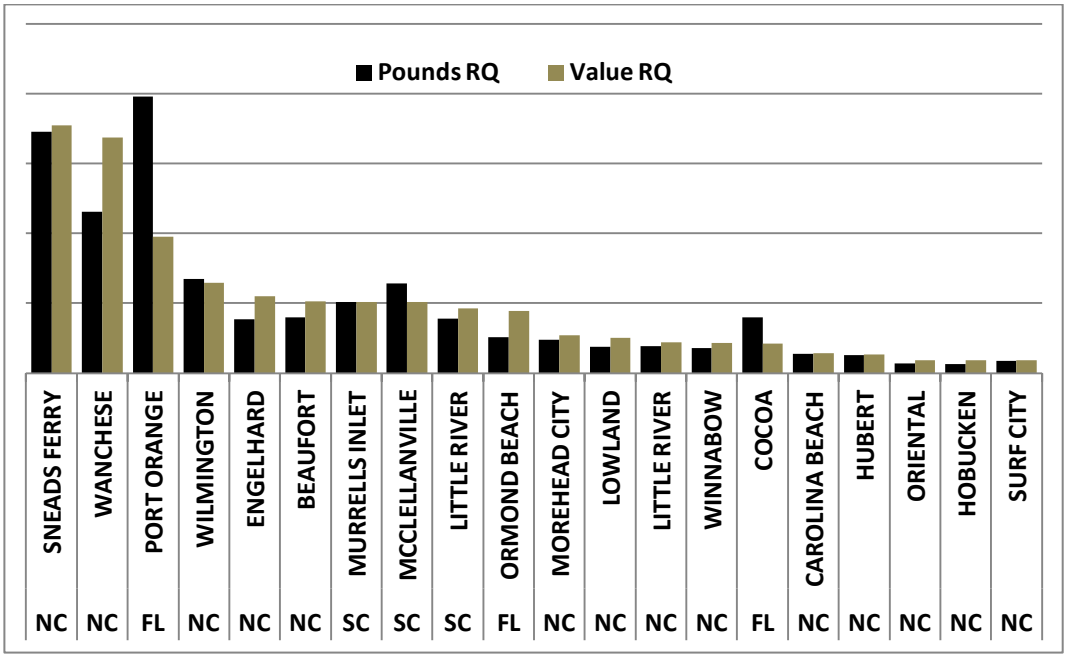

Figure 3.3.6. Regional quotient of pound and value for black sea bass by community in 2011
Source: NMFS SERO (2013).

Greater amberjack seems to be primarily a Florida fishery (**Figure 3.3.7**) as the only community outside of Florida in the top ten for regional quotient is Murrells Inlet, South Carolina. Cocoa, Key Largo, and Miami are the top three Florida communities and seem to outpace the others considerably.

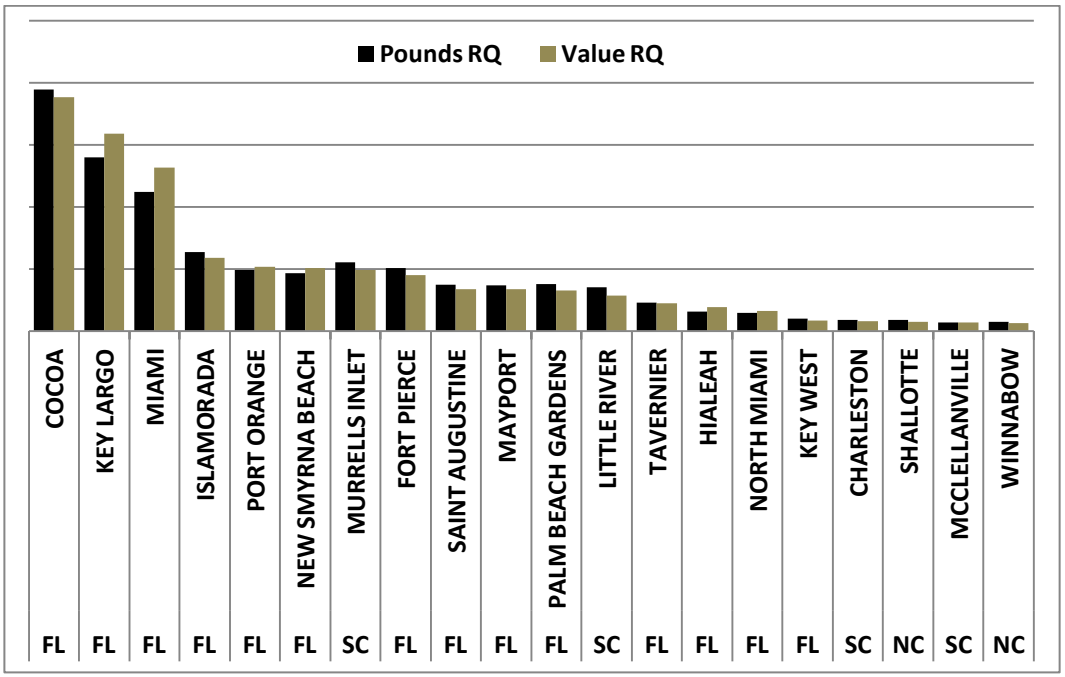

Figure 3.3.7. Regional quotient of pound and value for greater amberjack by community in 2011
Source: NMFS SERO (2013).

To better evaluate those communities that have some investment in those species that are part of this amendment, **Figure 3.3.8** provides the total pounds landed by community of all species included in the above regional quotient figures (gag, vermilion snapper, black sea bass, and greater amberjack) for 2011.

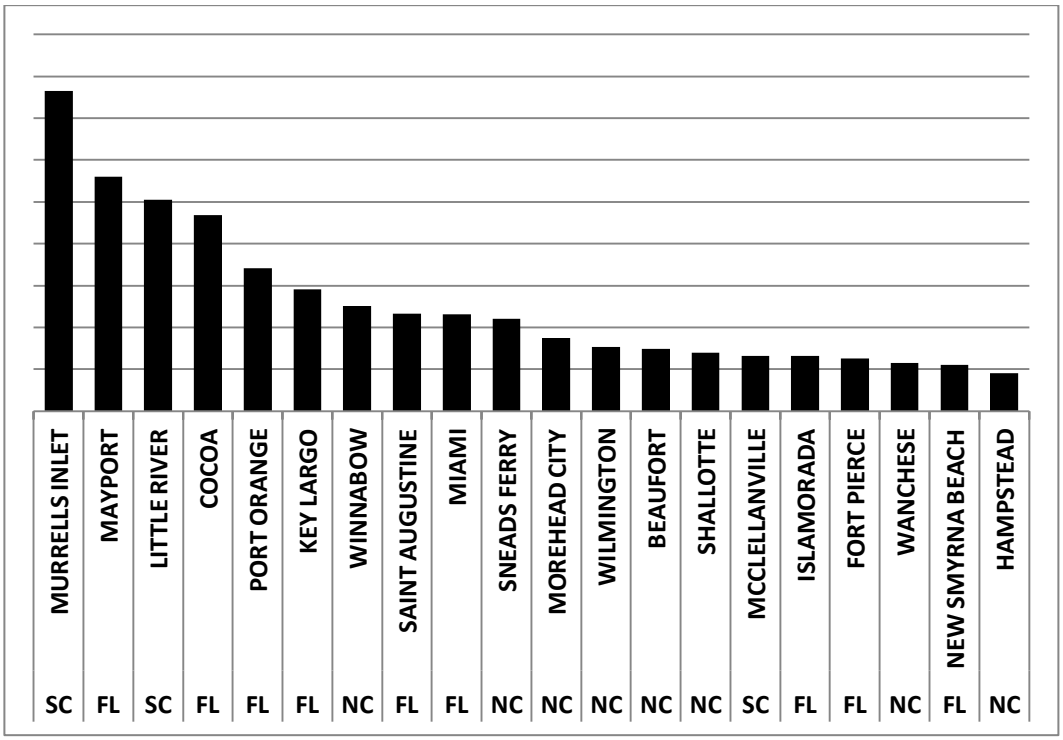

Figure 3.3.8. Pounds of combined snapper grouper species by dealer location in 2011. Source: NMFS SERO (2013).

Southeast Commercial and Recreational Engagement and Reliance on Fishing

Selecting the set of communities from the set of figures depicting regional quotient, a comparison of two indices recently developed to understand overall dependence on commercial fishing is presented below. To better capture how South Atlantic fishing communities are engaged and reliant on fishing overall, these indices were created using secondary data from permit and landings information for the commercial and recreational sectors (Jepson and Colburn 2013; Jacob et al. 2010). Fishing engagement is primarily the absolute numbers of permits, landings, and value within a community. 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 within a given community.

Using a principal component and single solution factor analysis, each community receives a factor score for each index to compare to other communities. Using the 31 communities that were identified in the regional quotient figures, factor scores of both engagement and reliance for commercial fishing were plotted onto a radar graph (census data were not available for Mayport, Florida and Winnabow, North Carolina and therefore do not have indices developed at this time). 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 1 and ½ standard deviation 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. A score above ½ standard deviation is considered moderately engaged or reliant, while over 1 standard deviation is considered very engaged or reliant.

Most of the communities in **Figure 3.3.9** are commercially engaged. Only the Florida communities of Cocoa, New Smyrna Beach, Ormond Beach, Palm Beach Gardens, and Port Orange do not exceed either threshold. The Florida communities of Miami, Marathon, Key West, Key Largo, and Fort Pierce are all highly engaged in commercial fishing. The Florida communities of Islamorada, Key West, and Marathon exceed the thresholds for reliance on commercial fishing. McClellanville, South Carolina is the one community that stands out as highly reliant upon fishing. Those four communities also exceed the thresholds for both reliance on and engagement in commercial fishing.

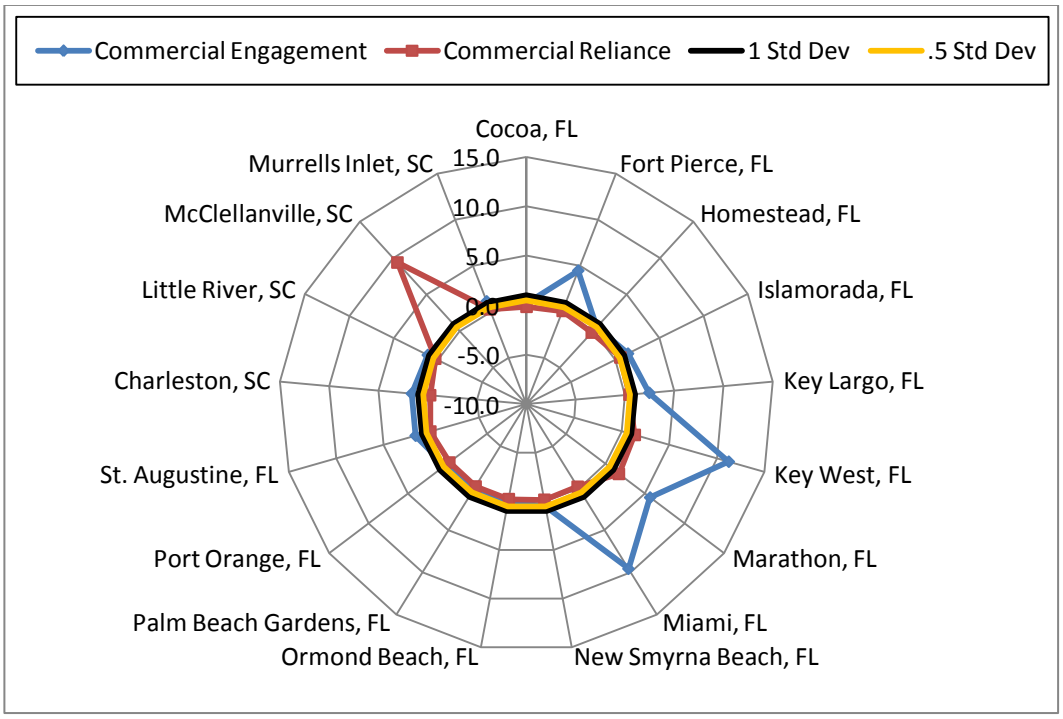

Figure 3.3.9. Commercial fishing engagement and reliance for fishing communities (FL & SC) with landings of species in Regulatory Amendment 14.
Source: SERO Social Indicators Database.

With regard to North Carolina communities and commercial engagement in **Figure 3.3.10**, only Emerald Isle, Oriental, Surf City, and Wrightsville Beach do not exceed either threshold for engagement. Wanchese, Wilmington, Beaufort, Morehead City, and Sneads Ferry are all highly engaged in commercial fishing. Those communities that exhibit reliance upon commercial fishing are Atlantic Beach, Beaufort, Oriental, Shallotte, Sneads Ferry, Wanchese, and Wrightsville Beach. The communities of Atlantic Beach, Beaufort, Shallotte, Sneads Ferry, and Wanchese exceed the thresholds for both engagement and reliance on commercial fishing and would therefore be likely to have a substantial portion of their economies depend upon commercial fishing.

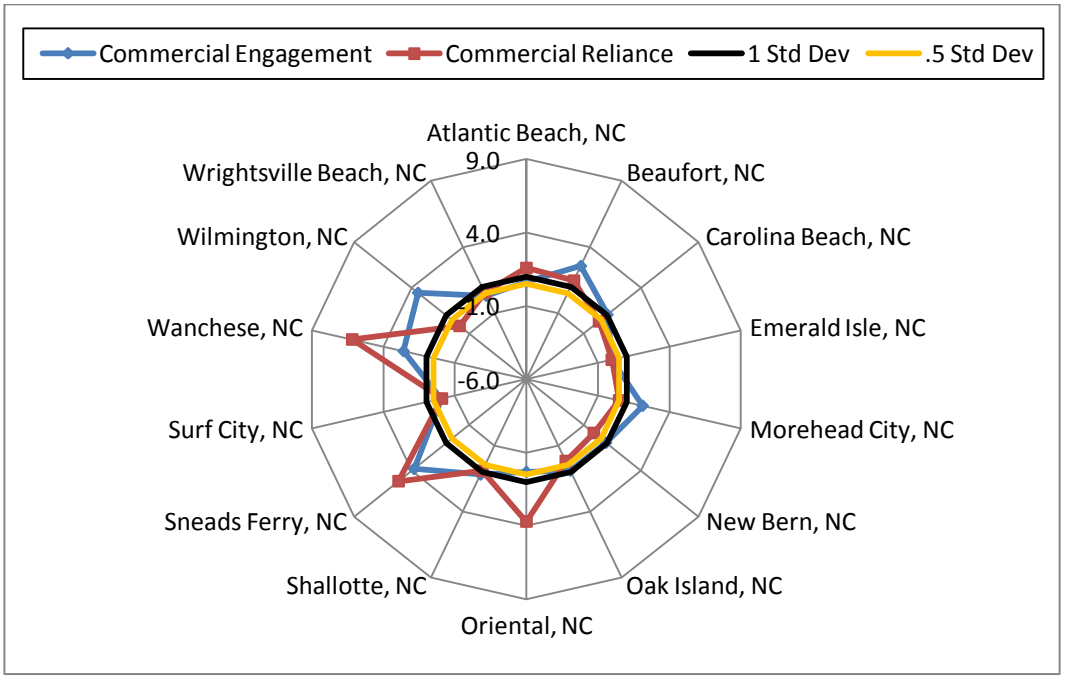

Figure 3.3.10. Commercial fishing engagement and reliance for fishing communities (NC) with landings of species in Regulatory Amendment 14.
Source: SERO Social Indicators Database.

When recreational engagement is examined in **Figure 3.3.11** for those communities outside of North Carolina, the only communities that do not exceed either threshold are Cocoa, Homestead, Ormond Beach, and Palm Beach Gardens in Florida, and McClellanville, South Carolina. With regard to recreational reliance, only Islamorada, Key West, and Marathon in Florida, and Murrells Inlet, South Carolina exceed the thresholds. The aforementioned three Florida communities are the only communities that exceed the thresholds for both engagement and reliance for recreational fishing.

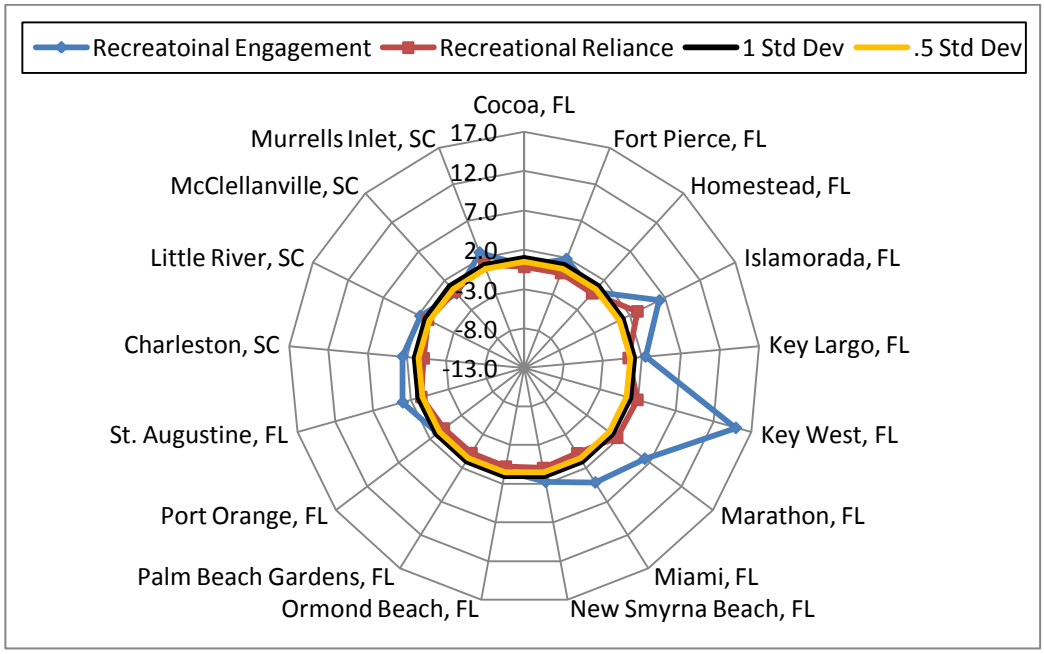

Figure 3.3.11. Recreational fishing engagement and reliance for fishing communities (FL & SC) with landings of species in Regulatory Amendment 14.
Source: SERO Social Indicators Database.

When we examine North Carolina communities with regard to recreational engagement and reliance we see that Atlantic Beach, Beaufort, Carolina Beach, Morehead City, Oak Island, Wanchese, Wilimington, and Wrightsville Beach all exceed the thresholds for recreational fishing engagement (**Figure 3.3.12**). With regard to recreational reliance, the communities of Atlantic Beach, Carolina Beach, Morehead City, Sneads Ferry, Wanchese, and Wrightsville Beach all exceed the thresholds. Therefore, Atlantic Beach, Carolina Beach, Morehead City, Wanchese, and Wrightsville Beach are all highly engaged and reliant upon recreational fishing as they exceed thresholds for both indices.

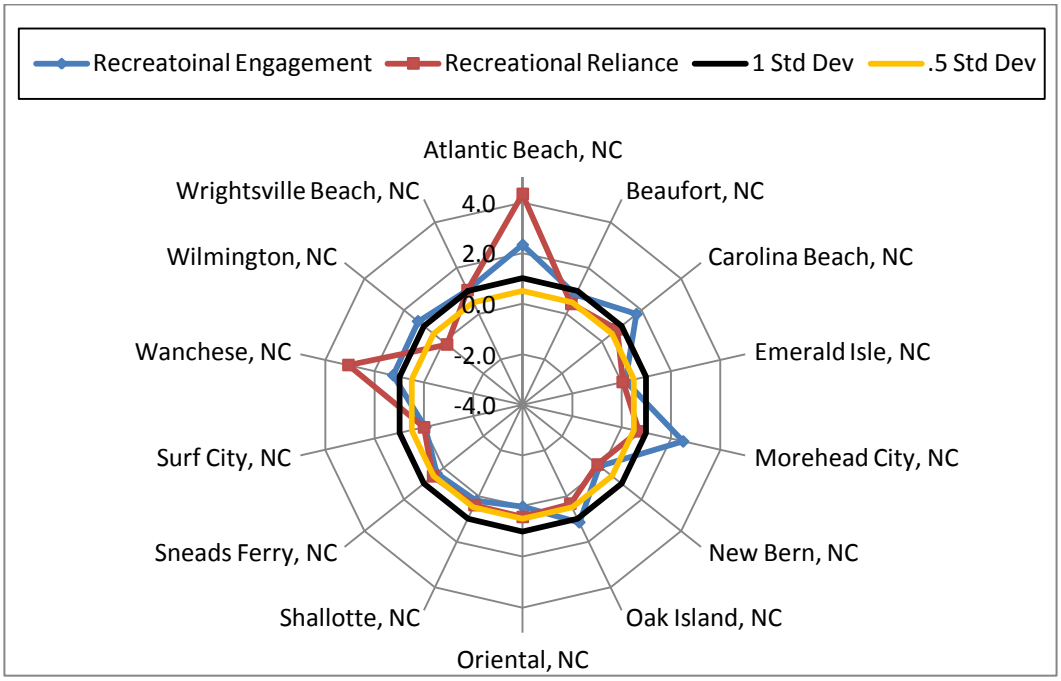

Figure 3.3.12. Recreational fishing engagement and reliance for fishing communities (NC) with landings of species in Regulatory Amendment 14.
Source: SERO Social Indicators Database.

There were five communities that exceed the threshold for both commercial and recreational engagement and reliance: Islamorada, Key West, and Marathon in Florida, and Atlantic Beach and Wanchese in North Carolina. These five communities would be expected to have a substantial part of their economies dependent upon fishing overall. If they also exhibit social vulnerabilities below, they may be susceptible to negative effects from any adverse regulatory change if they have high regional quotients for a particular species affected by alternatives contained within this amendment.

3.3.4 Environmental Justice

Executive Order 12898 requires federal agencies conduct their programs, policies, and activities in a manner that ensures individuals or populations are not excluded from participation in, or denied the benefits of, or subjected to discrimination because of their race, color, or national origin. In addition, and specifically with respect to subsistence consumption of fish and wildlife, federal agencies are required to collect, maintain, and analyze information on the consumption patterns of populations who principally rely on fish and/or wildlife for subsistence. The main focus of Executive Order 12898 is to consider "the disproportionately high and adverse human health or environmental effects of its

programs, policies, and activities on minority populations and low-income populations in the United States and its territories…" This executive order is generally referred to as environmental justice (EJ).

Commercial fishermen and coastal communities in the South Atlantic may experience some impacts by the proposed action depending upon the alternatives selected and whether they have negative or positive social effects. However, information on the race and income status for many of the individuals involved in fishing is not available. To evaluate where EJ concerns might exist, census data have been assessed to examine whether any coastal communities have poverty or minority rates that exceed thresholds for raising EJ concerns.

The threshold for comparison used was 1.2 times the state average for the proportion of minorities and population living in poverty (EPA 1999). If the value for the community is greater than or equal to 1.2 times this average, then the community is considered an area of potential EJ concern. Census data from the American Community Survey for the year 2010 were used to calculate the percentages and thresholds.

There were seven communities that exceeded the poverty threshold and are listed in **Table 3.3.21**. There were three Florida communities that exceeded the threshold for minorities: Ft. Pierce, Homestead, and Miami (**Table 3.3.22**). To take a closer look at those factors associated with EJ, a recently created database offers a comparable suite of measures of social vulnerability that is more comprehensive.

Table 3.3.21. Southeast communities exceeding the poverty environmental justice thresholds for 2011.

Community	Percent in Poverty	State threshold	Percent Over threshold
Cocoa, FL	27.0	16.56	10.44
Ft. Pierce, FL	28.1	16.56	11.54
Miami, FL	27.3	16.56	10.74
Homestead, FL	28.4	16.56	11.84
St. Augustine, FL	21.1	16.56	4.54
New Bern, NC	24.1	18.60	5.5
Wilmington, NC	22.4	18.60	3.8

Source: NMFS SERO 2013.

Table 3.3.22. Southeast Communities Exceeding the Minority Environmental Justice Thresholds for 2011.

Community	Percent Minorities	State threshold	Percent Over threshold
Ft. Pierce, FL	63.0	50.52	12.48
Homestead, FL	79.9	50.52	29.38
Miami, FL	89.8	50.52	39.28

Source: NMFS SERO 2013.

The aforementioned suite of indices was created to examine the social vulnerability of coastal communities and is depicted in **Figures 3.3.13** and **Figure 3.3.14**. 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 (Jepson and Colburn 2013; Jacob et al. 2013). Indicators such as increased poverty rates

for different groups, more single female-headed households and households with 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 vulnerabilities signify that it may be difficult for someone living in these communities to recover from significant social disruption that might stem from a change in their ability to work or maintain a certain income level.

There are four Florida communities that exceed both thresholds for all three social vulnerability indices in **Figure 3.3.13**: Cocoa, Fort Pierce, Homestead, and Miami. All other communities in Florida and South Carolina are below both thresholds and therefore do not exhibit social vulnerabilities.

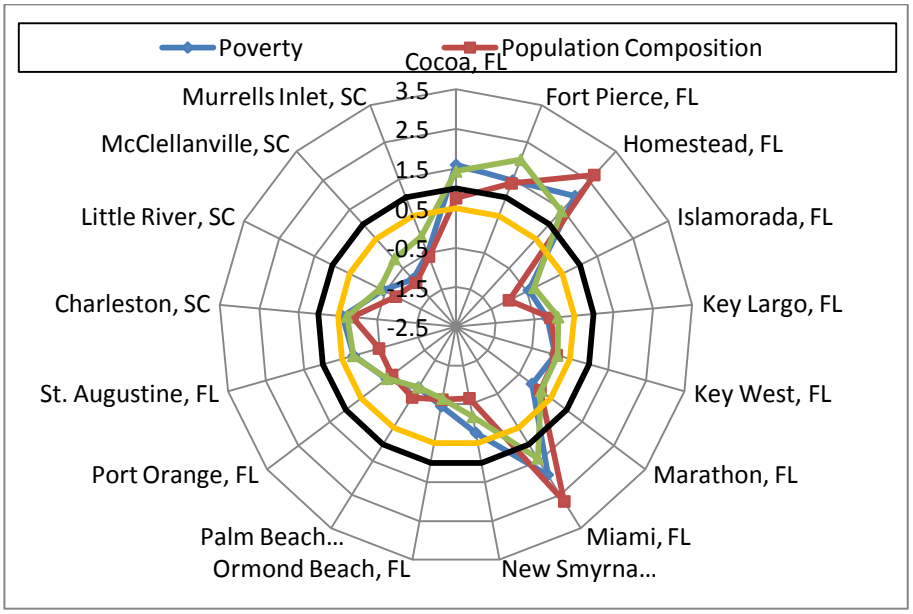

Figure 3.3.13. Social Vulnerability Indices for South Atlantic Fishing Communities (FL & SC). Source: SERO Social Indicators Database.

There are four communities that exceed the poverty threshold in North Carolina: Morehead City, New Bern, Wanchese, and Wilmington (**Figure 3.3.14**). Only one community exceeds the thresholds for population composition index and that is New Bern. As for personal disruption there were five communities that exceed at least one threshold: Beaufort, Carolina Beach, New Bern, Surf City and Wilmington. New Bern is the only community that exceeds both thresholds for all three indices.

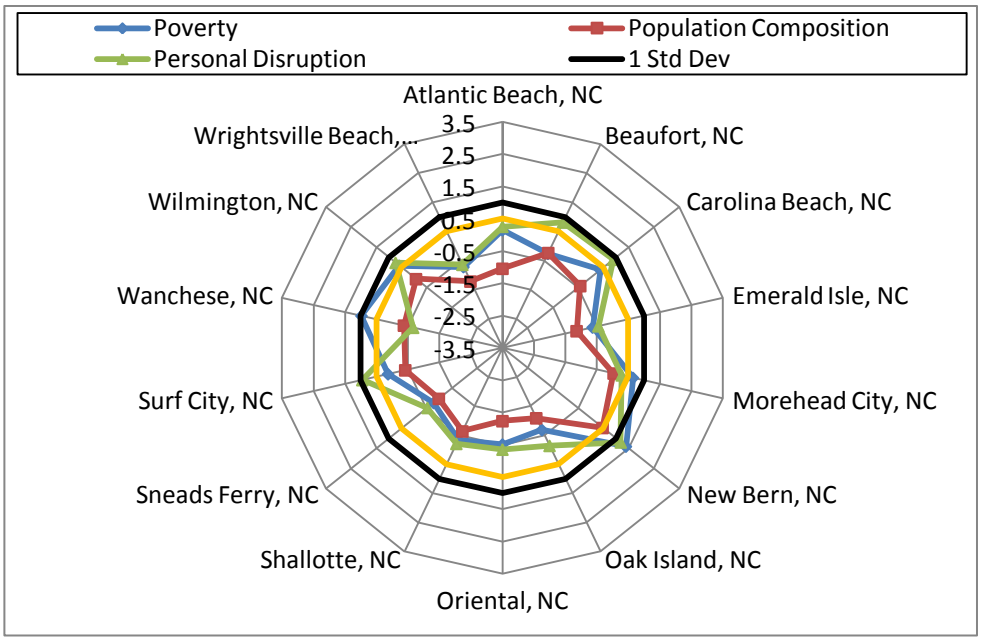

Figure 3.3.14. Social Vulnerability Indices for South Atlantic Fishing Communities (NC). Source: SERO Social Indicators Database.

In summary, five communities exhibit high social vulnerabilities: Cocoa, Fort Pierce, Homestead and Miami, Florida; and New Bern, North Carolina. The communities of Beaufort, Carolina Beach, Morehead City, Surf City, Wanchese, and Wrightsville Beach, all in North Carolina, show moderate vulnerabilities.

Those communities that exhibit high social vulnerabilities may experience negative social effects if the alternatives within this amendment have adverse impacts. This is not to say that these communities will be negatively affected, but they may experience difficulties if there were to be adverse impacts from the actions within this amendment. These are the communities that would be most at risk depending upon their fishing engagement and reliance. Of course, there are communities that do not show high vulnerabilities and may have high involvement without exhibiting high engagement and reliance. Murrells Inlet and Little River, South Carolina both have moderate engagement and reliance on both recreational and commercial fishing, yet do not exhibit high vulnerabilities. In these cases, there could be specific populations within those communities that might be vulnerable. However, we are not able to demonstrate that type of vulnerability at this time. In other cases like Mayport, Florida and Winabow, North Carolina we do not have sufficient information to determine their social vulnerabilities.

Although we have information concerning the community's overall status with regard to minorities and poverty and other social indicators, we do not have such information for fishermen themselves. Therefore, we can only place fishing activity within the community as a proxy for understanding the role that minorities and poverty and social vulnerability overall have in 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 the snapper grouper species included here.

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, conducting stock assessments, and for promulgating regulations to implement proposed plans and amendments after ensuring that management measures are consistent with the Magnuson-Stevens Act and with other applicable laws. In most cases, the Secretary has delegated this authority to NMFS.

The South Atlantic Council is responsible for conservation and management of fishery resources in federal waters of the U.S. South Atlantic. These waters extend from 3 to 200 miles 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 and legal matters, are open to the public. The South Atlantic Council uses its Scientific and Statistical Committee (SSC) to review the data and science being used in assessments and fishery management plans/amendments. In addition, the regulatory process is in accordance with the Administrative Procedure Act, in the form of "notice and comment" rulemaking.

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

NMFS' 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. The NOAA Office of General Counsel Penalty Policy and Penalty Schedules can be found at www.gc.noaa.gov/enforce-office 3.html.

Chapter 4. Environmental Consequences and Comparison of Alternatives

4.1 Action 1. Modify the commercial and recreational fishing years for greater amberjack

Alternatives for Action 1
(preferred alternatives in **bold**)

4. (No Action). The current commercial and recreational fishing years begin on May 1 and end on April 30.

5. Modify the commercial and recreational fishing years for greater amberjack to begin on January 1 and end on December 31.

6. Preferred. Modify the commercial and recreational fishing years for greater amberjack to begin on March 1 and end on February 28.

4.1.1 Biological Effects

Commercial Sector

Alternative 1 (**No Action**) would retain the current commercial fishing year for greater amberjack, which begins on May 1 and ends on April 30. **Figure 4.1.1** displays the increase in greater amberjack commercial landings during March due to demand for the species during Lent. Landings decrease in April because commercial vessels (as well as for-hire) are limited to 1 greater amberjack per person per day, or 1 per person per trip, whichever is more restrictive, and there is a prohibition on the sale of greater amberjack to protect greater amberjack in spawning condition. Landings peak in May following the harvest prohibition, and are fairly consistent during June through December.

Since less than 75% of the quota was caught during the 2007 to 2010 fishing years (**Table 4.1.1**), the South Atlantic Fishery Management Council (South Atlantic Council) developed Regulatory Amendment 9 to the Snapper Grouper Fishery Management Plan (FMP) (SAFMC 2011a) to increase the greater amberjack commercial trip limit from 1,000 pounds gutted weight (lbs gw) to 1,200 lbs gw on July 15, 2011, to achieve the commercial quota of 1,169,931 lbs gw.

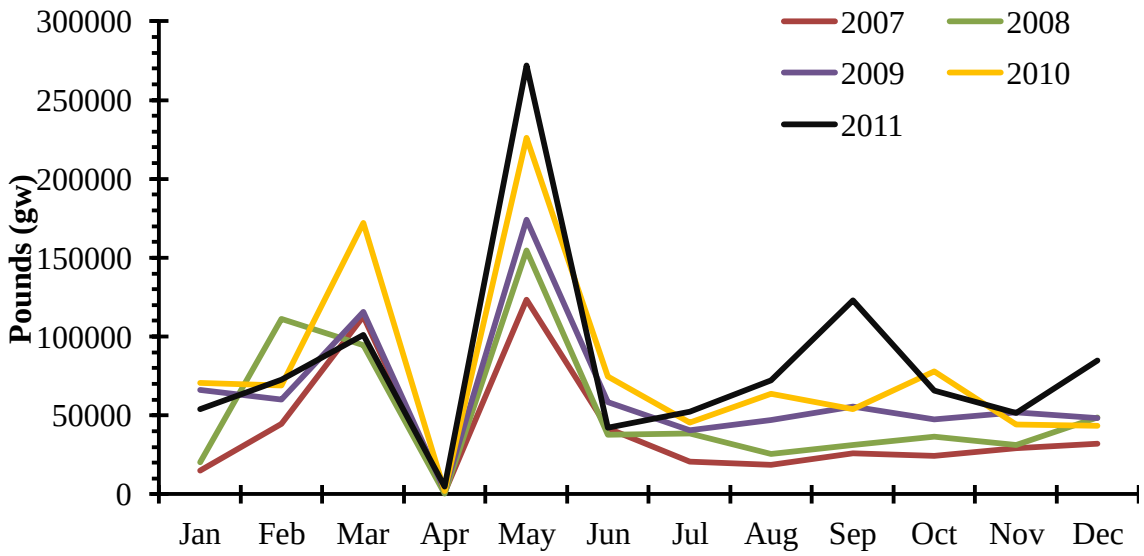

Figure 4.1.1. South Atlantic greater amberjack commercial landings (gw) by month from 2007 to 2011.

Following implementation of the increased trip limit, commercial landings for greater amberjack increased in the 2011/2012 fishing year (**Table 4.1.1**). On August 17, 2012, the supplemental final rule for the Comprehensive Annual Catch Limit (ACL) Amendment reduced the commercial ACL/quota for greater amberjack from 1,169,931 lbs gw to 769,388 lbs gw (800,163 pounds whole weight (lbs ww)). The new commercial quota of 769,388 lbs gw was not exceeded in the 2012/2013 fishing year; however, commercial harvest would have exceeded the new ACL in three out of the past six fishing years. There is concern among some fishermen that the commercial ACL could be met before March when there is increased demand for greater amberjack.

Table 4.1.1. Commercial landings (lbs gw) of greater amberjack from fishing years 2007/2008 to 2011/2012.

Species	Year	Fishing Season*	Total Landings (gw)	Quota/ACL (gw)	% of ACL harvested	Closure Date
Greater Amberjack	2012/2013	May 1 - April 30	719,853	769,388	93.56	N/A
	2011/2012		1,119,989	1,169,931	95.73	N/A
	2010/2011		862,087	1,169,931	73.69	N/A
	2009/2010		837,077	1,169,931	71.55	N/A
	2008/2009		648,247	1,169,931	55.41	N/A
	2007/2008		542,438	1,169,931	46.36	N/A

*Commercial harvest of greater amberjack is prohibited during April.

Greater amberjack spawn from January through June, with peak spawning in April and May (Harris et al. 2007), hence the current harvest restrictions during April of each year. Although fish in spawning condition were captured from North Carolina through the Florida Keys, spawning appears to occur primarily off south Florida and the Florida Keys (Harris et al. 2007). Some fishers have requested that the month of March remain open to harvest, because it is a productive month for fishing (i.e., consumers tend to buy more fish during Lent). Furthermore, greater amberjack are thought to migrate out of the Florida Keys by mid-May, thereby offering a limited fishing opportunity at the start of the current fishing year. The current accountability measure (AM) is an in-season closure of the commercial sector when the commercial ACL is reached or is projected to be reached. In Regulatory Amendment 14, the

South Atlantic Council considered **Alternative 2** and **Preferred Alternative 3** to modify the fishing year with the purpose of ensuring commercial harvest opportunities occur during March of each year.

With a fishing year beginning on May 1 and ending on April 30 (**Alternative 1, No Action**), it is expected that the commercial ACL of 1,169,931 lbs gw could be met during March if conditions were similar to those during the 2009 and 2010 fishing years (**Table 4.1.2**). Under **Alternative 2** the fishing year would begin in January and a closure of commercial harvest could potentially occur in September. **Preferred Alternative 3** would start the fishing year in March and the ACL could be met in February (based on landings from 2009/2010) or December (based on landings from 2010/2011; **Table 4.1.2**).

Some positive biological effects could be expected under **Preferred Alternative 3**, since the commercial ACL could be met before the onset of the January-June spawning season and thus provide more protection to the species. Under **Alternative 2**, the commercial sector could be closed in September (based on 2010 and 2011 landings), three months before the end of the proposed fishing year (**Table 4.1.2**). **Preferred Alternative 3** could also result in some negative biological effects when greater amberjack reopens in January, with fishers targeting the species heavily when the spawning period begins. However, greater amberjack is neither overfished nor undergoing overfishing, and ACLs/AMs are in place to ensure overfishing does not occur. Therefore, **Alternative 2** would not be expected to negatively impact the greater amberjack stock relative to **Alternative 1 (No Action)**. As shown in **Table 4.1.2**, there would not be a closure of the commercial sector for greater amberjack based on landings in 2006/2007, 2007/2008, and 2008/2009, under all three alternatives. Given the increased interest in the harvest of this species (**Table 4.1.1**), biological benefits would be highest for **Alternative 1** (**No Action**), followed by **Preferred Alternative 3**, and **Alternative 2**.

Table 4.1.2. Predicted closure dates for the commercial sector of greater amberjack under all three alternatives. Predicted closure dates used data from 2006 through 2011.

Fishing Year	Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)
	May-Apr	Jan-Dec	Mar-Feb
2006/2007	No Closure	No Closure	**No Closure**
2007/2008	No Closure	No Closure	**No Closure**
2008/2009	No Closure	No Closure	**No Closure**
2009/2010	19-Mar	25-Sep	**23-Feb**
2010/2011	4-Mar	23-Sep	**6-Dec**

Note: Predicted closure dates reflect current commercial ACL of 769,388 lbs gw.

Alternatives 1 (No Action)-3 (Preferred) for the commercial sector are unlikely to have adverse effects on listed *Acropora* species, large whales, or any distinct population segments (DPS) of Atlantic sturgeon. Previous Endangered Species Act (ESA) consultations determined the hook-and-line sector of the fishery (including effort targeting greater amberjack) was not likely to adversely affect *Acropora* species, large whales, or any DPS of Atlantic sturgeon. Regardless of the alternative selected, this action is not anticipated to increase the potential for interactions with smalltooth sawfish. Sea turtles nest along the East Coast of the United States from April-October, with peak nesting occurring from May-July. Sea turtle nesting brings gravid females closer to shore where they are more susceptible to interaction with snapper grouper fishing gear. Strictly based on the number of months fishing is projected to occur during sea turtle nesting season, **Alternative 2** and **Preferred Alternative 3** would have similar biological effects on these species. Under these alternatives, fishing is projected to occur

during all six sea turtle nesting months, including all three peak season months. **Alternative 1** (**No Action**) would have slightly more biological benefit relative to the other alternatives proposed because, if the earliest seasonal closure predicted occurred, fishing would only occur during five months of sea turtle nesting season. If the latest seasonal closure predicted occurred, fishing would take place during all six sea turtle nesting months. For both projected closure dates, fishing would occur during all three peak nesting months. None of the alternatives considered are expected to negatively impact or modify essential fish habitat (EFH), EFH Habitat Areas of Particular Concern (HAPC), or Coral HAPCs.

Recreational Sector

Currently, the fishing season for the recreational sector is the same as the commercial sector, from May 1 to April 30 (**Alternative 1, No Action**). Private recreational harvest is limited to 1 greater amberjack per person per day. During April of each year, for-hire vessels are limited to 1 fish per person per day or 1 fish per person per trip, whichever is more restrictive.

From 2007 through 2012, recreational landings were highest in May/June and tapered off in September (**Figure 4.1.2**). Recreational landings exceeded the current ACL of 1,167,837 lbs ww in the 2008/2009 and 2009/2010 fishing years; however, landings decreased in 2010/2011 (**Table 4.1.3**). It is possible that the closure of red snapper in 2010 contributed to reduced landings of greater amberjack in 2010/2011, since greater amberjack co-occur with red snapper. Greater amberjack also co-occur with vermilion snapper, black sea bass, and gag. Therefore, restrictive management measures for these species may have also affected recreational landings of greater amberjack.

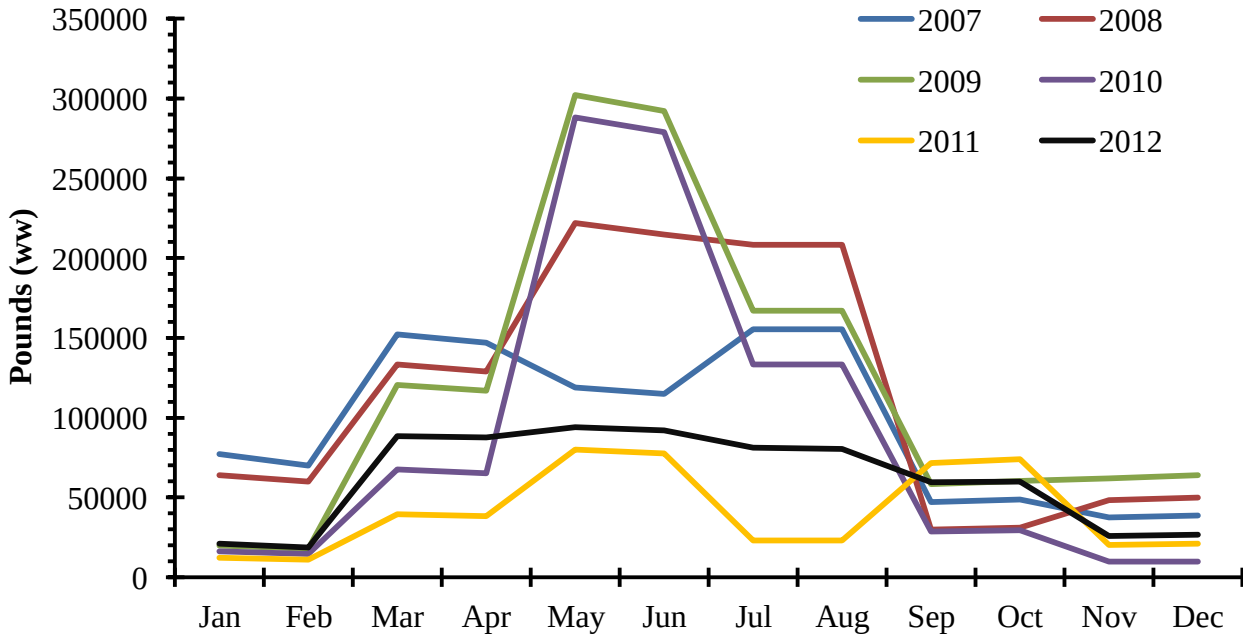

Figure 4.1.2. South Atlantic greater amberjack recreational landings by month from 2007 to 2012. The recreational landings include MRFSS and Headboat Survey (HBS) landings. Weight units are in whole weight to match the recreational ACL.

Table 4.1.3. Recreational landings for greater amberjack from 2006/2007 through 2010/2011, with the current fishing season of May to April in the South Atlantic.

Season	Landings (lbs ww)
2006/2007	998,900
2007/2008	1,103,171
2008/2009	1,287,695
2009/2010	1,337,001
2010/2011	1,012,783
2011/2012	610,606

Table 4.1.4 shows predicted dates the ACL would be met for the greater amberjack recreational sector. Following the same logic as in the discussion of the alternatives for the commercial sector, biological benefits would be greatest for **Alternative 1** (**No Action**), followed by **Preferred Alternative 3**, and **Alternative 2**.

Table 4.1.4. Predicted dates the recreational ACL would be met for all three alternatives for the recreational sector of greater amberjack in the South Atlantic using data from 2006-2011.

Fishing Year	Alternative 1	Alternative 2	Alternative 3 (Preferred)
	May-Apr	Jan-Dec	Mar-Feb
2006/2007	Not Met	Not Met	**Not Met**
2007/2008	Not Met	20-Aug	**Not Met**
2008/2009	30-Mar	24-Aug	**22-Oct**
2009/2010	28-Dec	Not Met	**31-Aug**
2010/2011	Not Met	Not Met	**Not Met**

Note: Predicted dates reflect current recreational ACL of 1,167,837 lbs ww. Recreational landings include both Marine Recreational Fisheries Statistic Survey (MRFSS) and Headboat Survey (HBS) landings.

Alternatives 1 (No Action)-3 (Preferred) for the recreational sector are unlikely to have adverse effects on listed *Acropora* species, large whales, or any DPS of Atlantic sturgeon. Previous ESA consultations determined the hook-and-line sector of the snapper grouper fishery (including effort targeting greater amberjack) was not likely to adversely affect *Acropora* species, large whales, or any DPS of Atlantic sturgeon. Regardless of the alternative selected, this action is not anticipated to increase the potential for interactions with smalltooth sawfish. Sea turtles nest along the East Coast of the United States in April-October, with peak nesting occurring in May-July. Sea turtle nesting brings gravid females closer to shore where they are more susceptible to interaction with snapper grouper fishing gear. Strictly based on the number of months fishing is projected to occur during sea turtle nesting season, all three alternatives would likely have similar biological effects. For each alternative, if the earliest seasonal closure predicted occurred, fishing would only occur during five months of sea turtle nesting season. However, if the latest seasonal closure predicted occurred, fishing would take place during all six sea turtle nesting months. For each alternative, regardless of the projected closure date, fishing would occur during all three peak nesting months. None of the alternatives considered are expected to negatively impact or modify EFH, EFH HAPCs, or Coral HAPCs.

4.1.2 Economic Effects

Commercial

From the 2009/2010 season through the 2011/2012 season commercial landings for greater amberjack would have met the current commercial ACL of 769,388 lbs gw (800,163 lbs ww; **Table 4.1.1**). If in the future the ACL is met or projected to be met, the April commercial harvest restrictions could be disruptive to fishing operations by potentially requiring two closures within the same fishing year as would be required by **Alternative 2** or **Preferred Alternative 3**. The likelihood of the commercial ACL being met in the future is greater as the ACL was reduced to 769,388 lbs gw (800,163 lbs ww) for the 2012/2013 season. Even with the more recent, lower ACL, landings in the 2012/2013 season did not exceed the current ACL.

Figure 4.1.1 shows that, on average, the highest landings for greater amberjack occur during the month of May, which historically has been the first month of the fishing year for greater amberjack (**Alternative 1, No Action**). However, as the greater amberjack season has not been closed before the end of the fishing year, there is no reason to think there is a derby occurring. Neither **Alternative 2**, nor **Preferred Alternative 3** is expected to affect the landings patterns unless fishermen perceive greater amberjack would reach its commercial ACL prior to the end of the fishing year. According to **Table 4.1.2**, regardless of the alternative selected, if fishing pressure remains as it was in the 2009/2010 season through the 2010/2011 season, it is expected that the season would close roughly 2 to 3 months prior to the end of the fishing year. Yet, since the current ACL was not exceeded in 2012/2013, it is impossible to know whether it would be exceeded in future years. As long as the ACL is not exceeded, none of the alternatives in Action 1 are expected to have direct or indirect, positive or negative economic effects. Should the ACL be met in future seasons, the total revenues may not differ much among the various alternatives unless there is a strong seasonality in ex-vessel prices. However, there are likely to be distributional effects favoring those fishermen who have access to the fish earlier in the season.

Recreational

The general procedure for calculating the economic effects of the alternatives on the recreational sector for all actions in this amendment involves estimating the expected changes in consumer surplus (CS) to anglers and net operating revenues (NOR) to for-hire vessels. CS 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. CS changes could come from expected changes in recreational catches, whereas NOR changes could come from expected changes in the number of trips by for-hire vessels. The key parameters for estimating CS changes are the number of fish and CS per fish; the key parameters for estimating NOR changes are the number of trips and NOR per trip. This general approach is the same as that used in previous amendments for evaluating the economic effects of regulatory actions on the recreational sector. A detailed description of this approach, including its limitations, is contained in other amendments and is included herein by reference (see for example, Amendment 17A, Regulatory Amendment 9, Regulatory Amendment 18, and Regulatory Amendment 19). Where practicable, the CS and NOR effects are quantified.

For purposes of quantifying CS and NOR effects in this amendment, CS per fish and NOR per angler trip are assumed to be constant. The value of CS per fish, after adjusting for inflation, is $32 (2011 dollars) based on a study by Haab et al. (2009). Based on a study by Dumas et al. (2009), the NOR values, after adjusting for inflation, are $157.27 (2011 dollars) per angler trip in charter boats and $70.25 (2011 dollars) per angler trip in headboats (Christopher Liese, NMFS SEFSC, personal communication, 2009).

Under the current accountability measure, if the recreational ACL is met, then during the following fishing year, recreational landings will be monitored for a persistence in increased landings and, if necessary, the length of the following recreational fishing season will be reduced by the amount necessary to ensure recreational landings do not exceed the recreational ACL in the following fishing year. The relative ranking of alternatives based on their economic effects is possible only under the assumption that each alternative would result in a shortening of the following fishing season. Relative to **Alternative 1** (**No Action**), which would reduce the following recreational fishing year for greater amberjack by 1 to 4 months, **Alternative 2** would result in 4 to 5 months reduction in the following fishing season, and 3 months under **Preferred Alternative 3**. These values under **Alternatives 2** and **3 (Preferred)** are upper bounds, which assume a 1-month reduction in length of the following fishing season under **Alternative 1 (No Action)**, a 4-month reduction under **Alternative 2**, and a 6-month reduction under **Preferred Alternative 3**, as can be inferred from **Table 4.1.4**. The general expectation is that a longer season, or shorter season reduction the year following an ACL overage, would be more economically beneficial to the recreational sector as it affords more fishing opportunities for anglers and more trips for the for-hire vessels. In this sense, **Alternative 1** (**No Action**) may be ranked first, followed by **Alternative 2**, and **Preferred Alternative 3**.

The ranking of alternatives may be pursued further by estimating the relative NOR changes under each alternative. Since NOR could differ among alternatives while CS would likely be the same for all alternatives, NOR changes can provide further insight into the ranking of alternatives. NOR for each alternative is estimated using average for-hire angler trips during 2008-2012 and the assumed constant NOR per angler trip. When referring to for-hire angler trips affected by fishing regulations, the customary choice has been target trips as they more closely relate to angler demand for trips than the other types of angler trips, such as catch trips or directed trips. Generally, there are more catch or directed trips than target trips. There are no corresponding target trips in the headboat sector, so target trips for this sector are assumed to be a percentage of the 2008-2012 average headboat angler days. This percentage is calculated as the proportion of total greater amberjack landings to total snapper grouper landings in the headboat sector.

Estimation results are presented in **Table 4.1.5** where NOR changes under **Alternatives 2** and **3 (Preferred)** are expressed relative to **Alternative 1** (**No Action**). It is quite clear that **Preferred Alternative 3** would result in NOR reductions relative to **Alternative 1 (No Action)** and higher NOR reductions than **Alternative 2**. It would appear, however, that charter boats might be economically better off under **Alternative 2**.

Table 4.1.5. Changes in for-hire angler trips and net operating revenues (NOR) due to **Alternative 2** and **Preferred Alternative 3** relative to **Alternative 1 (No Action)** for **Action 1**.

Fishing Mode	Change in Angler Trips	Change in Net Operating Revenue
Alternative 2		
Charter boats	174	$12,219
Headboats	(709)	($111,567)
TOTAL	(535)	($99,348)
Alternative 3 (Preferred)		
Charter boats	**(22)**	**($1,578)**
Headboats	**(1,014)**	**($159,546)**
TOTAL	**(1,036)**	**($161,124)**

Note: Parentheses indicate negative numbers. Dollar values are in 2011 dollars.

4.1.3 Social Effects

Fishing for greater amberjack is primarily based in Florida, and specifically in south Florida and the Florida Keys. In the commercial sector, Cocoa, Key Largo, and Miami, Florida have the most significant commercial landings of greater amberjack (**Figure 3.3.7**). In the recreational sector, important communities include Key West, Islamorada, Key Largo, and Miami (**Figure 3.3.13**). These Florida communities could be affected by changes in the fishing year for greater amberjack.

Alternative 1 (No Action) could have some negative social effects on the Florida communities that are commercially or recreationally engaged and reliant on fishing and have relatively high landings at the regional level for greater amberjack. Some economic benefits to the commercial and for-hire fleets are missed due to migration of the fish out of the waters of south Florida and the Florida Keys early in the current season starting in May, in addition to limited fishing opportunities in the area for private recreational anglers. **Alternative 2** would allow harvest for a longer period of time before a late spring migration and would provide access to the stock during Lent season, which is important for the commercial sector as there is increased demand for fish. Additionally, under **Alternative 2**, greater amberjack would be more likely to be open during the winter tourism season in south Florida and the Florida Keys, which would benefit the communities and businesses associated. **Preferred Alternative 3** would also allow harvest before the spring migration of the fish and for harvest during Lent, but could forfeit some social and economic benefits of an open season during winter tourism season if the recreational ACL is met prior to the end of the fishing year.

4.1.4 Administrative Effects

There would be no new administrative burden from **Alternative 2** or **Preferred Alternative 3**, since the current fishing year is already being monitored under **Alternative 1** (**No Action**). As expected with any changes to regulations, administrative costs could occur associated with disseminating the information and educating the public.

4.2 Action 2. Modify the fishing year for the black sea bass recreational sector

Alternatives for Action 2
(preferred alternatives in **bold**)

6. No Action. The recreational fishing year for black sea bass begins on June 1 and ends on May 31.
7. Modify the recreational fishing year for black sea bass to begin on January 1 and end on December 31.
8. **Preferred. Modify the recreational fishing year for black sea bass to begin on April 1 and end on March 31.**
9. Modify the recreational fishing year for black sea bass to begin on October 1 and end on September 30.
10. Modify the recreational fishing year for black seas bass to begin on May 1 and end on April 30.

4.2.1 Biological Effects

Black sea bass harvest rates have increased in recent years, with quota closures generating an early season "derby" fishery, changing the seasonal dynamic of harvest (**Figure 4.2.1**). The 2012/13 recreational black sea bass fishing season opened on June 1, 2012 and was closed due to a quota overage on September 4, 2012. In response to an assessment update, Regulatory Amendment 19 (SAFMC 2013f) increased the recreational ACL to 1,033,980 lbs ww during 2013-2015, and will reduce it to 1,001,177 lbs ww after 2015.

Projecting the 2013/2014 season length for black sea bass is complicated primarily due to two factors: (1) rebuilding status of the population, and (2) changes in catch rates. Since the black sea bass stock is rebuilt, a plateau of the exploitable population biomass might lead to a more stable catch rate. Coupled with an increased ACL, this could result in a longer season. A recent assessment (SEDAR 25 Update 2013) has indicated that a strong year class is moving through the black sea bass portion of the snapper grouper fishery. An increase in exploitable population abundance might lead to an increase in catch rate, resulting in the quota being caught more quickly. On the other hand, if the increased ACL implemented through Regulatory Amendment 19 (SAFMC 2013f) reduces derby fishing, the ACL may be caught more slowly. Due to uncertainty in these dynamics, a variety of projection methods were used to explore possible closure dates for the South Atlantic recreational black sea bass sector under the increased ACL in Regulatory Amendment 19.

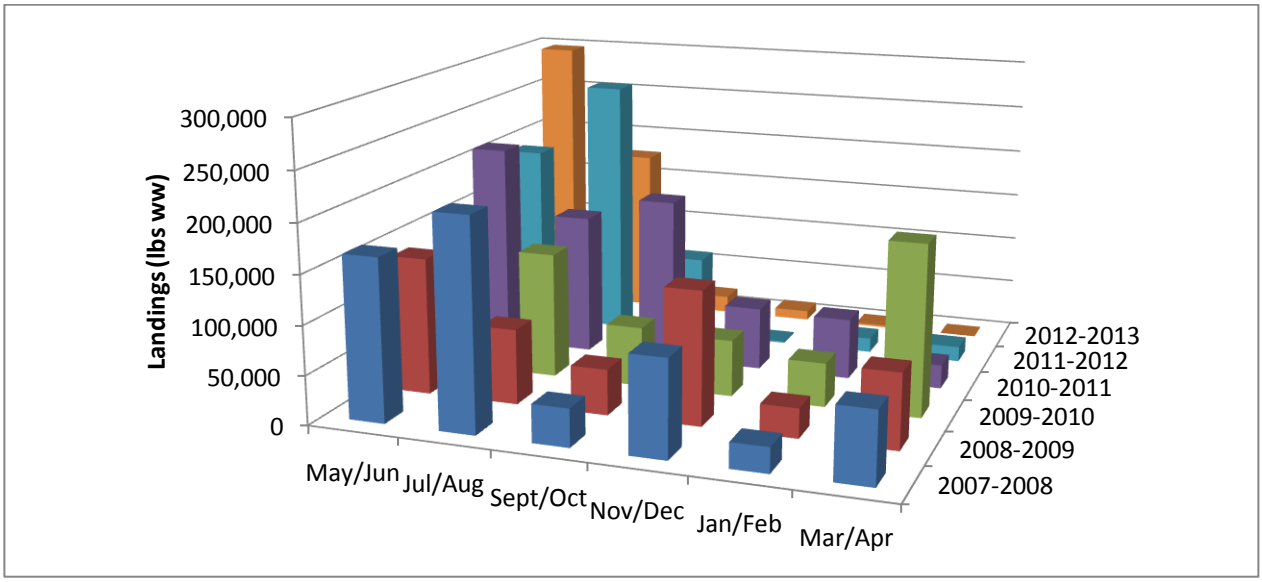

Figure 4.2.1. South Atlantic recreational harvest of black sea bass by wave and fishing season.
Note in years without quota closures, some portion of the May/June landings may be from the previous season.
Source: SEFSC MRFSS-based ACL Data (2013).

Over 50 different recreational catch rate projection models were developed, with three selected as the most useful for management. The best fitting of the numerous Seasonal Autoregressive Integrated Moving Average (SARIMA) models predicted an extremely high catch rate for 2013 (**Figure 4.2.2A**). This model explained 51% of the variability in catch rate by wave between 1999/2000 and 2012/2013. This SARIMA model represented a "continuity run" of the model used to predict the quota closure date for the 2012/2013 recreational black sea bass season (SERO-LAPP-2012-04). This high-predicted catch rate is likely due to the increases in catch rate observed between the 2010/2011 and 2012/2013 recreational seasons. Assuming the stock is recovered, as indicated by the recent assessment (SEDAR 25 Update 2013), the increasing catch rates observed in 2011/2012 and 2012/2013 may have reached a peak. Exploitable stock abundance was not a significant term in the model fit. The model was unable to account for changes in fisher behavior resulting from an increased ACL. The large increase in the ACL, as recently implemented through Regulatory Amendment 19 (SAFMC 2013f), may result in relaxing effort and lower daily catch rates. Finally, the model predicts high catch per day in the later months (September onwards), which may be unrealistic, due to localized depletion in nearshore areas due to early season harvest, and reductions in fishing pressure in fall and winter due to school schedules, deteriorating weather conditions, etc.

The second model developed used the observed catch rates from the 2012/2013 season for June-August, assuming catch rates will stop increasing with stock recovery. This model then used the SARIMA forecast catch rates for September onwards. If the stock continues to grow, this model may underestimate early season catch rates. If localized depletion occurs, this model may overestimate late season catch rates.

The third model simply projected the in-season mean annual harvest rates using a generalized linear model (GLM) with a log-linked negative binomial error distribution (**Figure 4.2.2B**). A seasonal trend was then imposed upon the GLM forecast annual total harvest using the mean catch per month from 2008-2010, the most recent years in which all months were open (**Figure 4.2.3**).

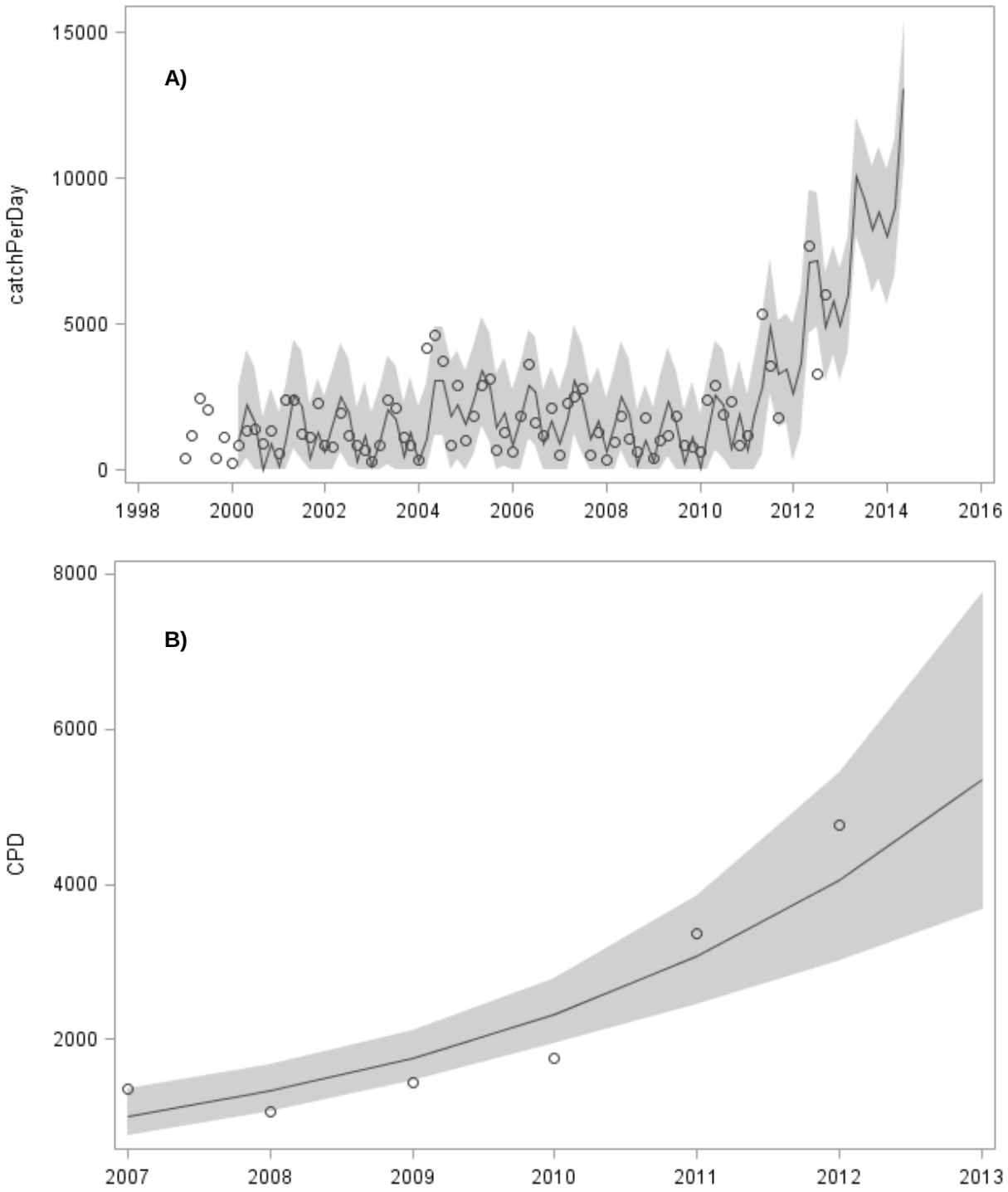

Figure 4.2.2. Forecasts of 2013-2014 season recreational South Atlantic black sea bass fishery daily catch rates ('CPD' or 'CatchPerDay') using (**A**) seasonal autoregressive integrated moving average model fit to bimonthly ('wave') catch rates and (**B**) generalized linear model fit to fishing season catch rates.
Gray bands denote 95% confidence limits; open circles denote observed catch rates.
Note the model fits for the final two years of Model (A) are rather poor, and these trends are perpetuated in the projections.

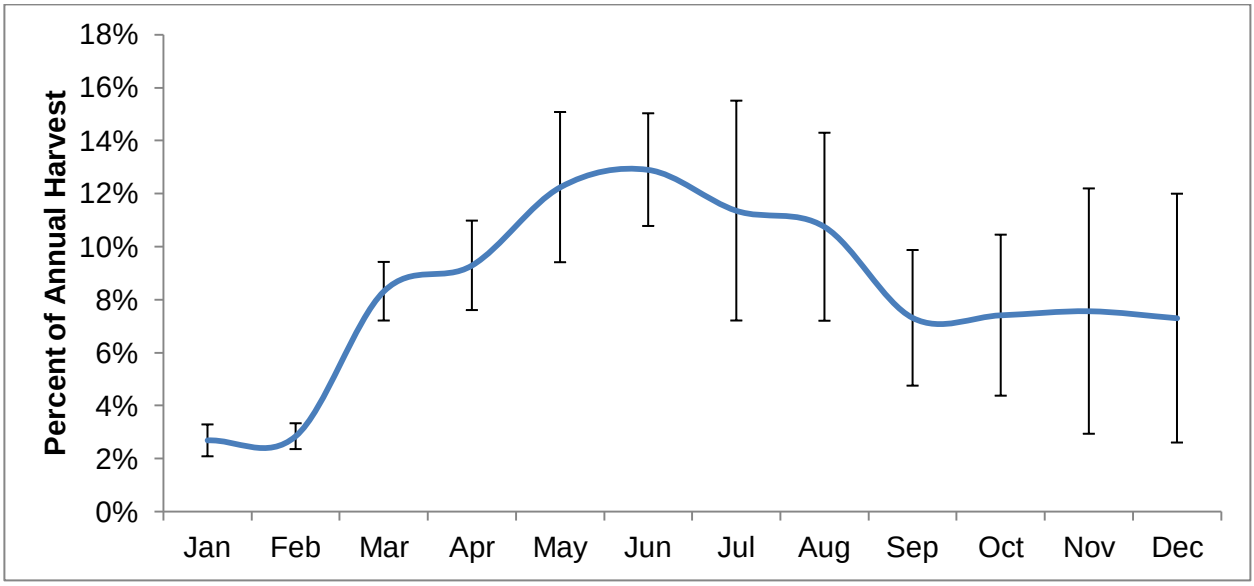

Figure 4.2.3. Mean percent and standard error of annual recreational South Atlantic black sea bass harvest, by month (2008-2010).
These monthly harvest percentages were used to seasonalize the projected harvest rate from the GLM shown in Figure 4.4.2.

Accountability Measures (AMs) are in place to ensure ACLs are not exceeded and overfishing does not occur. Therefore, biological effects of the various alternatives would be related to fishing effort during the black sea bass spawning season, and possible incidental catch of black sea bass when harvest of co-occurring species is open, or incidental catch of co-occurring species when black sea bass is open.

There is evidence of a change in peak spawning of black sea bass with spawning occurring earlier in the year in the more southern latitudes. Hood et al. (1994) reported that black sea bass females in the Gulf of Mexico spawn during December through April with highest incidence of hydrated oocytes occurring during January and March. Further north in the South Atlantic, McGovern et al. (2002) indicate black sea bass females spawn during January to June with peak spawning occurring during March-April. Sedberry et al. (2006) stated that in the South Atlantic spawning females occur during most months of the year with a major spawning period of February through April. In the Mid-Atlantic Bight, spawning progresses seasonally from south to north, and starts as early as April off the coast of North Carolina and Virginia (Able et al. 1995). Spawning continues from June through October, peaking in August. Steimle et al. (1999) states spawning in the Middle Atlantic Bight population occurs from May to July during inshore migrations, but can extend to October-November.

McGovern et al. (2002) did not report spawning season by state; however, sample size for October through March was small and most black sea bass during those months were obtained through fishery-dependent sampling in South Carolina. Given the evidence provided by the literature of a south to north progression in spawning, it is likely that peak spawning of black sea bass off Florida and Georgia may occur earlier than during March-May. Furthermore, peak spawning of black sea bass off North Carolina may occur later than March-May.

If the start date of the recreational season remains June 1, as would be the case under **Alternative 1 (No Action)**, the three models estimated that a quota closure would be necessary between September and March, with most scenarios suggesting November or December as the most likely closure month

(**Table 4.2.1**). Because the start of the fishing year is after peak spawning of black sea bass, and the recreational ACL is likely to be met at the beginning of the spawning season, **Alternative 1 (No Action)** is the most likely alternative to protect black sea bass when they are in spawning condition. However, black sea bass do not form temporary spawning aggregations like grouper species, and are not considered to be vulnerable to overfishing during the spawning season like shallow water grouper species. With the exception of vermilion snapper, shallow water grouper species are closed to harvest during January-April. Regulatory Amendment 18 to the Snapper Grouper FMP (SAFMC 2013e) removed the November-March recreational closure for vermilion snapper. Therefore, fishermen are likely to catch and discard black sea bass during January-May when targeting vermilion snapper. However, survival of released black sea bass is estimated to be 93%.

Table 4.2.1. Projected closure dates and season length (days) for recreational fishing season alternatives in Action 2 under three different projection model runs, with 95% confidence intervals.

	SARIMA			**2012 (Jun-Aug), SARIMA (Sept-May)**			**GLM (Seasonal)**		
Alternative	**Mean**	**L95%**	**U95%**	**Mean**	**L95%**	**U95%**	**Mean**	**L95%**	**U95%**
Alternative 1 (No Action): June 1-May 31	20-Sep	28-Oct	29-Aug	23-Dec	27-Feb	25-Nov	14-Nov	27-Mar	7-Sep
	111	149	89	205	271	177	166	299	98
Alternative 2: January 1-December 31	2-May	6-Jun	7-Apr	18-Jun	10-Sep	15-May	14-Jul	28-Sep	3-Jun
	121	156	96	168	252	134	194	270	153
Preferred Alternative 3: April 1-March 31	**17-Jul**	**18-Aug**	**27-Jun**	**8-Oct**	**8-Dec**	**10-Sep**	**21-Aug**	**24-Nov**	**6-Jul**
	107	**139**	**87**	**190**	**251**	**162**	**142**	**237**	**96**
Alternative 4: October 1-September 30	31-Jan	16-Mar	4-Jan	9-Apr	17-Jun	21-Feb	20-May	18-Jul	2-Apr
	122	166	95	190	259	143	231	290	183
Alternative 5: May 1-April 30	15-Aug	17-Sep	27-Jul	11-Nov	10-Jan	15-Oct	24-Sep	4-Jan	31-Jul
	106	139	87	194	254	167	146	248	91

Note: These projections use the ACL from Regulatory Amendment 19 of 1,033,980 lbs ww.

All analyses assume monthly catch rates projected for the 2013/2014 season, due to increasing uncertainty with projecting further into time. If catch rates for the 2014/2015 season are higher (due to increased effort or a good year class moving through the fishery), the season would be shorter than projected above. If catch rates are lower due to reduced effort, drops in spawning stock biomass, or some other factor, the season could be longer than projected above. Also, this modeling approach does not account for any transition of high catch per unit effort early in the season (regardless of start date) or derby fishery conditions that may transpire with a change in season start date.

Alternative 2 would allow fishing to begin when the spawning season begins in January, and the recreational ACL would not be expected to be met until well after the spawning season had ended (**Table 4.2.1**). Further, fishing would occur when co-occurring shallow water groupers are closed to harvest (January through April). However, recreational catch of black sea bass is most likely to occur when fishermen target vermilion snapper. Therefore, allowing the fishing year to begin on January 1 would allow fishermen to target black sea bass and vermilion snapper on the same trips, which would be expected to reduce bycatch of black sea bass during January-May when compared to **Alternative 1 (No Action)**. The black sea bass recreational fishing season is not expected to last all year, whereas Regulatory Amendment 18 (SAFMC 2013e) projected that the recreational vermilion snapper ACL would not be met. Therefore, regardless of when the recreational fishing year starts for black sea bass, it

is expected there will be a period of time when vermilion snapper will be open and black sea bass will be closed. However, survival of incidentally caught black sea bass when fishermen target vermilion snapper is expected to be very good.

Preferred Alternative 3, which would start the recreational fishing season on April 1, would provide less protection to the black sea bass spawning stock than **Alternative 1 (No Action)**, but would provide greater protection to black sea bass in spawning condition than **Alternative 2**. Since black sea bass begin to spawn in January, and **Alternative 2** would allow fishing for black sea bass to occur throughout the January-May spawning season, it would have more direct negative impacts than the other alternatives. However, some bycatch of black sea bass would be expected to occur during January-March when recreational fishermen target vermilion snapper. As mentioned previously, survival of released black sea bass is estimated to be 93%.

Under **Alternative 4**, the recreational fishing year would begin on October 1. Similar to **Alternative 2**, this alternative could allow for fishing activity to continue during months of peak spawning for black sea bass and would have fewer positive biological effects than **Alternative 1 (No Action)** and **Preferred Alternative 3** (**Table 4.2.1**). Like **Alternative 2**, harvest for black sea bass would occur when fishermen are targeting vermilion snapper.

Alternative 5 would modify the recreational fishing year to begin on May 1. Depending on the rate of daily catch and fishing effort, the season could close in August or last until November (**Table 4.2.1**). Similar to **Preferred Alternative 3**, this alternative would result in black sea bass being closed during part of the peak spawning months and thus would impart a similar level of biological benefit to the black sea bass stock. The opening of black sea bass would occur when fishing for shallow water grouper species opens, but there would be some incidental catch of black sea bass when recreational fishermen target vermilion snapper during January-April.

The Marine Recreational Information Program (MRIP) collects data by two-month waves (i.e., wave 1 = Jan/Feb, wave 2 = Mar/Apr, …, wave 6 = Nov/Dec). Starting the fishing year in the middle of a wave, as under **Alternative 1 (No Action)** and **Preferred Alternative 3** and if May or March were open to harvest, respectively, would greatly reduce NMFS' ability to ascertain whether landings took place during the current fishing year or the previous. Only if landings were distributed uniformly within the wave could the landings be accurately assigned. However, uniform landings within a wave are not likely since many factors (i.e., weekends, holidays, etc.) can change fishing effort within a two-month time period. It is more likely that landings are not uniform within a wave and this could lead to uncertainty in ACL monitoring, and might make overages or underages difficult to detect. If the payback provision for quota overages were to remain in place, the uncertainty resulting from inaccurately assigning landings to a month could have impacts on fishermen. This has not been an issue in recent years due to the recreational ACL being met prior to May; thus, all wave 3 landings have been attributed to the current season. However, given that the black sea bass ACL increased through Regulatory Amendment 19 (SAFMC 2013f), it is more likely that starting the fishing year in the middle of an MRIP wave would become a problem.

Alternatives 1 (No Action)-5 are unlikely to have adverse effects on listed *Acropora*, large whales, or any DPS of Atlantic sturgeon. Previous ESA consultations determined the hook-and-line sector of the snapper grouper fishery (including effort targeting black sea bass) was not likely to adversely affect *Acropora*, large whales, or any DPS of Atlantic sturgeon. Regardless of the alternative selected, this

action is not anticipated to increase the potential for interactions with smalltooth sawfish. Sea turtles nest along the East Coast of the United States in April-October, with peak nesting occurring in May-July. Sea turtle nesting brings gravid females closer to shore where they are more susceptible to interaction with snapper grouper fishing gear. Strictly based on the number of months fishing is projected to occur during sea turtle nesting season, **Preferred Alternative 3** would likely have the fewest biological benefits to sea turtles. Under this alternative, fishing is projected to occur for 3-6 months of the sea turtle nesting season, including all three peak nesting months. **Alternative 5** is also likely to provide fewer biological benefits, relative to the other alternatives. Under this alternative, fishing is projected to occur for 3-5 months of the sea turtle nesting season, and occur during all three peak nesting months. Similarly, fishing under **Alternative 1 (No action)** is projected to occur for 3-4 months of the nesting season and during two of the peak nesting months. The biological benefit of **Alternatives 2** and **4** are difficult to predict. If the earliest seasonal closure predicted for **Alternative 2** occurred, fishing would occur for only 0.5 months of the nesting season and would not occur during any of the peak nesting months. Conversely, if the latest seasonal closure predicted for **Alternative 2** occurred, fishing would take place during all six sea turtle nesting months, including all three peak nesting months. Similarly, under **Alternative 4**, if the earliest seasonal closure predicted occurred, no fishing would occur during sea turtle nesting season. If the latest seasonal closure predicted occurred, fishing would take place during approximately 4.5 sea turtle nesting months, including all three peak nesting months. None of the alternatives considered are expected to negatively impact or modify EFH, EFH HAPCs, or Coral HAPCs.

4.2.2 Economic Effects

Projections on the recreational landings of black sea bass have determined that fishing closures would occur under each fishing season alternative, including the no action alternative (**Table 4.2.1**). It is understood that closures result directly from triggering the in-season AM. Because the recreational sector is projected to reach its ACL under each alternative, changes in total CS are unlikely to happen, assuming a constant CS per fish and the absence of overages[1]. In view of this, the major CS effect of changing the fishing year would be in the form of altering the distribution of CS among anglers across fishing modes and states. Generally, the distribution of CS would favor those anglers in fishing modes and states that would have first access to the black sea bass resource through a fishing year change.

Projections also show that the length of the fishing season for black sea bass would differ among the various alternatives. This would create differing opportunities for trips taken by for-hire vessels. In general, a longer season would allow for more for-hire vessel trips, thus allowing these vessels to generate higher NOR.

[1] Overages have occurred in the recreational sector for black sea bass, by about 3% in 2010-2011, 44% in 2011-2012, and 5% in 2012-2013. A major issue about overages is that the higher the overages, the higher would be the attendant in-season CS. However, a payback would reduce the CS of the following season. Although assuming the absence of overages is a simplifying assumption, it does not appear to be a very unreasonable assumption. First, the recreational ACL was substantially increased via Regulatory Amendment 19. Second, monitoring the recreational ACL has improved over the years. Third, if overages do occur but by about the same level for all alternatives, it would be similar to having no overages for the purpose of comparing alternatives. Fourth, if overages do occur but would not differ much among the various alternatives, overages would not play an important role when comparing the CS effects of the various alternatives. Fifth, it is very difficult to predict the level of overages under each alternative so that assuming the absence of overages is a reasonable starting point for analytical purposes.

Results from three projection models vary quite widely within each and across all alternatives. All three projection models predict that **Preferred Alternative 3** and **Alternative 5** would result in shorter fishing seasons when compared with **Alternative 1** (**No Action**). Two projection models (SARIMA and GLM) predict that **Alternatives 2** and **4** would result in longer fishing seasons than **Alternative 1** (**No Action**), whereas one projection model (call it Mixed SARIMA) predicts the fishing season to be shorter under **Alternatives 2** and **4**. It would appear then that the recreational sector would be worse off under **Preferred Alternative 3** and **Alternative 5** but maybe better off under **Alternatives 2** and **4**.

A closer analysis of the NOR effects of the various fishing season alternatives reveal that the for-hire sector would be economically worse off under **Alternatives 2** and **4**, regardless of the model used for projecting quota closures (**Table 4.2.2**). The for-hire sector would be economically better off under **Preferred Alternative 3** and **Alternative 5** when using the Mixed SARIMA model for closure projections. It is noted that charter vessels would be economically better off under **Preferred Alternative 3** based on the GLM projection model for closures and under **Alternative 5** regardless of the model used for projecting closures.

A few notes are worth mentioning regarding the NOR estimates. First, the various projection models are used only for referencing the closure dates and season lengths and not for estimating NOR effects. Second, the methodology used for NOR estimation is similar to the one used for Action 1. Third, there is some potential bias introduced by using historical trips. In general, trips are higher at the start of the fishing season especially after a long closure period. If a fishing year alternative were projected to close those months with relatively high trips while allowing fishing to be open in months with relatively low trips, the resulting overall trips under that alternative would likely be lower.

Table 4.2.2. Changes in the number of for-hire trips and net operating revenues (NOR) due to the various fishing year alternatives relative to Alternative 1 (No Action), Action 2.

	SARIMA		MIXED SARIMA		GLM	
	Trips	**NOR**	**Trips**	**NOR**	**Trips**	**NOR**
Alternative 2						
Charter	(759)	($53,288)	(579)	($40,698)	(381)	($26,800)
Headboat	(10,209)	($1,605,531)	(9,140)	($1,437,376)	(4,106)	($645,707)
TOTAL	(10,967)	($1,658,819)	(9,719)	($1,478,074)	(4,487)	($672,506)
Preferred Alternative 3						
Charter	**(187)**	**($13,112)**	**288**	**$20,257**	**29**	**$2,044**
Headboat	**(3,967)**	**($623,815)**	**931**	**$146,430**	**(1,117)**	**($175,649)**
TOTAL	**(4,153)**	**($636,927)**	**1,219**	**$166,688**	**(1,088)**	**($173,606)**
Alternative 4						
Charter	(861)	($60,516)	(913)	($64,154)	(716)	($50,298)
Headboat	(11,218)	($1,764,240)	(12,016)	($1,889,825)	(9,020)	($1,418,517)
TOTAL	(12,079)	($1,824,756)	(12,930)	($1,953,978)	(9,736)	($1,468,815)
Alternative 5						
Charter	7	$525	280	$19,637	129	$9,035
Headboat	(1,580)	($248,509)	476	$74,936	(469)	($73,718)
TOTAL	(1,573)	($247,984)	756	$94,573	(340)	($64,683)

Note: Parentheses indicate negative numbers. NOR values are in 2011 dollars. The projection models are used for reference only and not for estimating NOR effects.

4.2.3 Social Effects

Black sea bass is one of the more important recreational species in the South Atlantic at this time. Management measures that could contribute to increased recreational fishing opportunities for black sea bass could result in positive effects for the recreational sector by adding more revenue to the for-hire sector and a private sector with increased fishing opportunities.

In general, a longer recreational season would be expected to result in the most benefits to the recreational sector and associated coastal communities and fishing businesses. The projections from different models in **Table 4.2.1** show potential closure dates, and vary depending on the assumptions in the model. **Alternative 1 (No Action)** would be expected to have no additional negative impacts on the recreational black sea bass sector, although some positive impacts could be forfeited if a different start date could help extend the season.

There could be some localized impacts due to a change in the start date. For example, the start date of January 1 under **Alternative 2** would likely be the least beneficial for North Carolina and South Carolina if the recreational ACL is met before weather allows for fishing in the northern states. Those fishing communities in North Carolina and South Carolina that are more dependent upon recreational fishing are: Murrells Inlet and Little River in South Carolina; Atlantic Beach, Carolina Beach, Morehead City, Wanchese, and Wrightsville Beach in North Carolina. However, **Alternative 2** could be beneficial to fishermen in Florida due to few fishing opportunities in the other states that might push the black sea bass harvest closer to the ACL. Communities in Florida more dependent upon recreational fishing are: Islamorada, Key West, Marathon, and St. Augustine. An opening in October under **Alternative 4** could affect recreational fishing opportunities due to hurricane season, holidays, school schedules, etc. **Preferred Alternative 3** and **Alternative 5** would likely not affect specific areas, but most likely have regional effects based on season length and regional fishing patterns and could result in shorter fishing seasons compared to **Alternative 1 (No Action)**.

4.2.4 Administrative Effects

Mechanisms are already in place for monitoring and enforcing the current recreational fishing year under **Alternative 1** (**No Action**). The administrative costs and time burdens under **Alternatives 2** through **5** are not expected to be significantly different from the current burden under **Alternative 1** (**No Action**).

Alternatives* for Action 3
(preferred alternatives in **bold**)

1. No Action. If the ACL is met or is projected to be met, independent of stock status, prohibit the harvest and retention of black sea bass. If the ACL is exceeded, reduce the recreational ACL in the following season by the amount of the overage.

2. (Preferred) NMFS will annually announce the recreational fishing season start and end dates. The fishing season will start on April 1 and end on the date NMFS projects the ACL will be met.

3. NMFS will annually announce the recreational fishing season start and end dates. The fishing season will start on April 1 and end on the date NMFS projects the ACT will be met.

4. If the ACL is met or is projected to be met, independent of stock status, prohibit the harvest and retention of black sea bass.

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

4.3 Action 3. Modify the recreational accountability measure for black sea bass

4.3.1 Biological Effects

Preferred Alternative 2 in this action is similar to Preferred Alternative 3 under Action 2. With an April 1 opening, the recreational black sea bass season could last until the end of June or early December, according to predictions in **Table 4.2.1**. An April 1 start date for recreational harvest of black sea bass could diminish bycatch of shallow water groupers, for which there is a January-April spawning season closure. However, some bycatch of black sea bass would be expected to occur during January-March when recreational fishermen target vermilion snapper. As mentioned previously, however, survival of released black sea bass is such that negative biological impacts would be minimal. Under **Preferred Alternative 2**, NMFS would announce the length of the recreational season for black sea bass annually in the *Federal Register* prior to the April 1 start date each year, with an end date corresponding to when the recreational ACL is projected to be met for that year.

Alternative 3 proposes utilizing the recreational annual catch target (ACT) instead of the recreational ACL to predict the length of the recreational black sea bass season. In this case, the recreational black sea bass season would be from one to three weeks shorter than that predicted for **Preferred Alternative 2** (**Table 4.3.1**).

Table 4.3.1. Projected closure dates and season length (days) for Action 3, Alternative 3 under three different projection model runs, with 95% confidence intervals.

SARIMA			2012 (Jun-Aug), SARIMA (Sept-May)			GLM (Seasonal)		
Mean	**L95%**	**U95%**	**Mean**	**L95%**	**U95%**	**Mean**	**L95%**	**U95%**
3-Jul	30-Jul	16-Jun	11-Sep	5-Nov	11-Aug	2-Aug	16-Oct	25-Jun
93	120	76	163	218	132	123	198	85

Note these projections use the ACT from Regulatory Amendment 19 of 903,905 lbs ww.

In terms of biological effects, **Alternative 1 (No Action)** would result in direct positive biological effects on the black sea bass stock since it provides the best mechanism to ensure the ACL is not exceeded. The next most biologically beneficial alternative would be **Alternative 3** because basing the length of the season on when the ACT is expected to be met would help ensure that the ACL is not exceeded. Not only would this be biologically beneficial to the black sea bass stock, it would be utilizing the ACT as the trigger to management action, which is indeed the manner in which an ACT

was designed to be utilized. **Preferred Alternative 2** would offer less direct biological benefits that **Alternative 3** or **Alternative 1 (No Action),** because there would not be a buffer to prevent the ACL from being exceeded.

Announcing the length of a fishing season prior to harvest being allowed, as would occur under both **Preferred Alternative 2** and **Alternative 3**, could alter fishing behavior in a manner that would cause negative biological effects. The current in-season closure of recreational fishing once the ACL is met or projected to be met is designed to prevent ACL overages. However, for the 2010/2011 fishing year, the black sea bass recreational ACL was exceeded by 19%. Similarly, the recreational ACL was exceeded by 44% during the 2011/2012 fishing year (SERO website, accessed July 9, 2013). During the 2012/2013 fishing year, the recreational ACL was exceeded by 4%. It is possible therefore, that fishing effort would actually increase if the end date of the season is specified in advance and thus contribute to ACL overages and increased risk of overfishing.

Past experience in other fisheries, such as Gulf of Mexico recreational red snapper (see **Appendix F**, SERO-LAPP-2011-01; Fig. 4), has shown that the announcement of a fishing season's end date at the start of the season leads to a derby mentality. Effort compression during a fixed season leads to increased daily catch rates, and this cycle becomes difficult to reverse, leading to progressively shorter seasons in subsequent years to prevent an ACL overage. This process can become quite contentious, reduces safety at sea, and reduces the ability to prevent ACL overages by truncating the season length and the ability to use in-season recreational harvest data to project a quota overage date. Under **Alternative 1 (No Action)**, fishermen would continue to benefit from the longest possible season with the least risk for an ACL overage (SERO-LAPP-2012-04). Under **Preferred Alternative 2** and **Alternative 3**, however, the risk of an ACL overage increases because there would no longer be an in-season closure. **Preferred Alternative 2** would create a longer season than **Alternative 3** but would carry a higher risk of an ACL overage, whereas **Alternative 3** would result in a shorter season than **Preferred Alternative 2** with less risk of the recreational ACL being exceeded. Neither of these trends is desirable and could result in negative biological impacts without in-season closures or payback provisions. However, setting the following year's fixed season under **Preferred Alternative 2** and **Alternative 3** would take into account the overages or underages in the previous year. Thus, the following year's fixed season would likely be shorter if overages occurred in the previous year or longer if the entire ACL or ACT were not landed in the previous year.

In-season monitoring with an in-season closure announcement, as under **Alternative 1 (No Action)**, allows the angler maximum time on the water and promotes harvest of the entire ACL. Under **Preferred Alternative 2** and **Alternative 3**, if the fishing rate is faster than projected due to the derby mentality previously discussed or an increase in the underlying stock size, the ACL could be exceeded because the length of the fishing season would be fixed and there would be no in-season closure to prevent an overage. If the fishing rate is slower than projected due to a reduction in effort or underlying stock size, anglers would be discarding fish after the projected fishing season had ended even though their ACL had not been met. Under the status quo, NMFS develops comprehensive projection models accounting for a myriad of factors including in-season harvest to develop the best possible estimate of black sea bass season length. **Preferred Alternative 2** and **Alternative 3** could undermine this process and could result in increased risk of overfishing as well as an increased risk of under-harvest.

Alternative 4 would have similar biological effects as **Alternative 1 (No Action)**, but without the benefit of a payback if an ACL overage were to occur. However, the black sea bass stock is not

undergoing overfishing and is rebuilt (SEDAR 25 Update 2013). Therefore, there may not be a biological need for a payback if overages are not large, and occur infrequently.

In summary, in terms of biological benefits, **Alternative 1 (No Action)** would rank highest, followed by **Alternative 4**, **Alternative 3**, and **Preferred Alternative 2**.

4.3.2 Economic Effects

Several issues are worth clarifying regarding the interpretation of **Preferred Alternative 2** and **Alternative 3** for purposes of determining their economic implications. First, these alternatives assume that the recreational fishing year for black sea bass is April 1 through March 31, which is the preferred alternative in Action 2. Second, these alternatives would establish a fixed season every year, which is set before the start of the fishing season. Third, no fishing closure would occur within the fixed season even if the ACL or ACT is reached. Fourth, harvest or possession of black sea bass is prohibited outside the fixed season. Fifth, setting the following year's fixed season would take into account the overages or underages in the previous year. This last point implies that the following year's fixed season would likely be shorter if overages occurred in the previous year or longer if the entire ACL or ACT were not landed in the previous year.

One unique feature of **Preferred Alternative 2** or **Alternative 3**, each of which would set a fixed season, is that it would directly address the economics of the recreational sector. With a fixed season known to fishing participants at the start of the fishing season, anglers and for-hire vessel owners/operators can develop a better plan that would take advantage of better fishing opportunities. Anglers can schedule ahead of time the fishing trips that they deem would provide them with the highest benefits. For-hire vessel owners/operators can develop better booking schedules to accommodate varying interests of their angling customers without the threat that some fishing trips would be cancelled due to fishery closures. Both private anglers and for-hire vessel owners/operators can pick and choose the time to fish to minimize risks due to inclement weather or malfunctioning boats or fishing equipment. In a sense, a fixed season would allow private anglers to maximize their benefits from fishing and for-hire vessel owners/operators to maximize their net operating revenues. However, overages are likely to occur with a fixed season especially if fishing does not cease even after the ACL or ACT is reached. Overages in one year would result in a shortened season the following year, and as discussed in **Section 4.3.1**, the seasons could become shorter over time. Once the season becomes too short to provide adequate fishing opportunities, setting the fixed season would become extremely hard and highly contentious. Fishing benefits that are initially high would tend to dissipate over time as the season becomes more abbreviated. In a sense, the economic benefits from a fixed season would be high at the start but would eventually diminish.

The various alternatives have varying degrees of restrictiveness on recreational fishing opportunities for black sea bass. In general, the more restrictive the alternative, the less its attendant economic benefit in the short term. Only **Alternative 1** (**No Action**) provides for a payback applied directly to the following year's ACL. Because of its payback provision, this alternative may be considered more restrictive than the other alternatives, with the possible exception of **Alternative 3**. This latter alternative would provide for a fixed season that would likely be shorter than any of the other alternatives, at least in the immediate future, because it makes use of the ACT for setting the end date of the fixed season. Given the closure projections presented in **Table 4.2.1**, **Alternatives 1 (No Action)**,

2, and **4** would likely have the same season length, at least in the first year this regulatory amendment takes effect.

Current predictions on the recreational harvest of black sea bass show that the recreational ACL (**Table 4.2.1**) or ACT (**Table 4.3.1**) would likely be reached before the normal end of the fishing year. Assuming, as in Action 2, a constant CS per fish and no overages, **Alternatives 1** (**No Action**), **2 (Preferred)**, and **4** would result in the same CS effects as the same number of fish would be harvested under each alternative. On the other hand, **Alternative 3** would be associated with lower CS as it would provide for fewer fish to be harvested. Not much more can be said about the constant CS per fish assumption due to relatively limited information. However, unlike with Action 2, it is possible to probe further into the assumption regarding overages.

In the past, overages occurred under **Alternative 1** (**No Action**), and it is likely that overages could still occur under this alternative even with the increase in the ACL implemented through Regulatory Amendment 19 (SAFMC 2013f). If overages were to occur under **Alternative 1** (**No Action**), they would also occur at about the same level under **Alternative 4** because both alternatives have an identical in-season AM. Therefore, it is expected that the CS effects of **Alternative 1** (**No Action**) would be the same as those of **Alternative 4** even in the presence of overages. **Preferred Alternative 2** and **Alternative 3** would set a fixed season without any closure within the fixed season even if the ACL (under **Preferred Alternative 2**) or ACT (under **Alternative 3**) were reached. Based on landings projections (**Table 4.2.1**), the length of the fishing season under **Preferred Alternative 2** would likely be set initially to equal that of **Alternative 1** (**No Action**) and **Alternative 4**. But because recreational harvest would be closed under **Alternative 1** (**No Action**) or **Alternative 4** when the ACL is reached or projected to be reached and not under **Preferred Alternative 2**, this latter alternative is more likely to result in more overages than **Alternative 1** (**No Action**) or **Alternative 4**. Thus, **Preferred Alternative 2** would likely result in higher short-term CS effects than the other two alternatives. **Alternative 3** would also set a fixed season but a shorter one than **Preferred Alternative 2**. Hence, **Preferred Alternative 2** would likely result in more overages and therefore higher CS effects than **Alternative 3**. Over the short term, **Preferred Alternative 2** would likely result in the highest CS effects, followed likely by **Alternative 3** and **Alternative 1** (**No Action**) or **Alternative 4.**

With overages occurring in the current year, the following year's ACL would be reduced under **Alternative 1** (**No Action**) but not under the other alternatives. It is very likely that the following year's CS would be lowest under **Alternative 1** (**No Action**). Overages would most likely result in a shorter fixed season for the following year under **Preferred Alternative 2** or **Alternative 3**. Nevertheless, overages are still likely to occur, and unless the fixed season becomes extremely short, overages would not be totally curtailed. Thus, the following year's CS under **Preferred Alternative 2** or **Alternative 3** would still be higher than that under **Alternative 1** (**No Action**). Considering that **Alternative 3** would have a shorter fixed season than **Preferred Alternative 2**, the latter would yield higher CS effects than the former. The following year's CS effects of **Alternative 4** are somewhat more uncertain, but there is a good possibility that monitoring could improve and thus possibly reduce the level of overages in the following year. In this sense, **Alternative 4** would yield lower CS effects than either **Preferred Alternative 2** or **Alternative 3**, unless the fixed season under **Preferred Alternative 2** or **Alternative 3** becomes extremely short. There is then a very good possibility that the following year's ranking of alternatives in terms of CS effects would remain the same. Given that the stock is no longer undergoing overfishing, is not overfished, and is rebuilt (SEDAR 25 Update 2013), the ranking of alternative in terms of CS effects could be maintained over the mid-term.

The various alternatives would likely have different effects on for-hire vessels' NOR. During the first year of implementation, the NOR effects of **Alternative 1** (**No Action**) and **Alternative 4** would be the same as both alternatives provide for the identical in-season AM. Because the season is fixed under **Preferred Alternative 2** or **Alternative 3**, these alternatives would likely allow for more for-hire vessel fishing trips as there is no fishing closure when the ACL or ACT is reached, resulting in relatively higher NOR than either **Alternative 1** (**No Action**) or **Alternative 4**. If overages occur in the current year and the ACL is reduced the following year under **Alternative 1** (**No Action**), for-hire trips could also decrease so that NOR under **Alternative 1 (No Action)** would be less than that under **Alternative 4**. With overages in the current year, the following year's fixed season under **Preferred Alternative 2** or **Alternative 3** would be shortened, possibly resulting in for-hire vessel trips and NOR reductions. Because harvest could still continue during the fixed season even after exceeding the ACL of ACT, for-hire vessel trips and NOR would likely be higher under **Preferred Alternative 2** or **Alternative 3** than under **Alternative 4**. With a relatively longer fishing season, **Preferred Alternative 2** would likely result in higher NOR than **Alternative 3.** Although not quite as clear as with the CS case, the ranking of alternatives in terms of NOR effects would be the same in the short-term and mid-term.

The long-term CS and NOR effects of the various alternatives would depend on their effects on the sustainability of the stock to support recreational fishing opportunities. In general, a more restrictive AM would have a higher probability of protecting the stock over the long term. Although, as noted in **Section 4.3.1**, the stock assessment methodology accounts for overages by including them in the projections, overages especially at elevated levels cannot remain for long without impairing the stock. If the stock undergoes overfishing, or reverts to being overfished, more restrictive regulations would be needed, resulting in CS and NOR reductions. Along this line, **Alternative 1** (**No Action**) would appear to be the best AM alternative in maintaining the sustainability of the stock, especially because it requires paybacks in cases of overages. Unless the fishing season becomes too constrictive under **Preferred Alternative 2** or **Alternative 3**, the next best AM would appear to be **Alternative 4** as it has the ability to impose harvest closure once landings reach or are projected to reach the ACL or ACT. Between **Preferred Alternative 2** and **Alternative 3**, the latter may be considered to offer a higher probability of protecting the stock over the long term as it would be provide for a shorter fishing season.

In the absence of estimates of short-term, mid-term, and long-term effects on CS and NOR, it is not possible to determine which alternative would provide the best net economic effects over time. It may only be noted that actual balancing of the mid-term and long-term effects on CS and NOR would partly depend on how fast management can react to the changing status of the stock. This, in turn, would partly depend on timely knowledge of the status of the stock.

4.3.3 Social Effects

Black sea bass is one of the most important species for the recreational sector in the South Atlantic region, particularly in North Carolina and South Carolina. Public input reflects how the low recreational ACLs established in the black sea bass rebuilding plan (and subsequent early in-season closures once the ACLs were met) have negatively impacted the for-hire sector and private recreational anglers by restricting harvest and reducing fishing opportunities. Positive feedback from recreational fishermen on the recent increase in the black sea bass ACL in Regulatory Amendment 19 (SAFMC 2013f) illustrates the importance of the species for many for-hire businesses and for private recreational fishermen.

Figure 4.3.1 shows recreational engagement and reliance for 14 communities for which recreational black sea bass fishing is important. The indices were developed in Colburn and Jepson (2012) and Jacob et al. (2013) to illustrate how potential changes could impact different communities based on the community's engagement and reliance on fishing. Recreational engagement is calculated using the number of recreational permits and vessels designated as recreational by homeport and owners address. Fishing reliance has the same variables as engagement divided by population to give an indication of the per capita influence of this activity. Communities with substantial engagement and reliance on recreational black sea bass fishing include Little River, South Carolina; Murrells Inlet, South Carolina; Morehead City, North Carolina; and Carolina Beach, North Carolina. The community of Wanchese, North Carolina is also reliant.

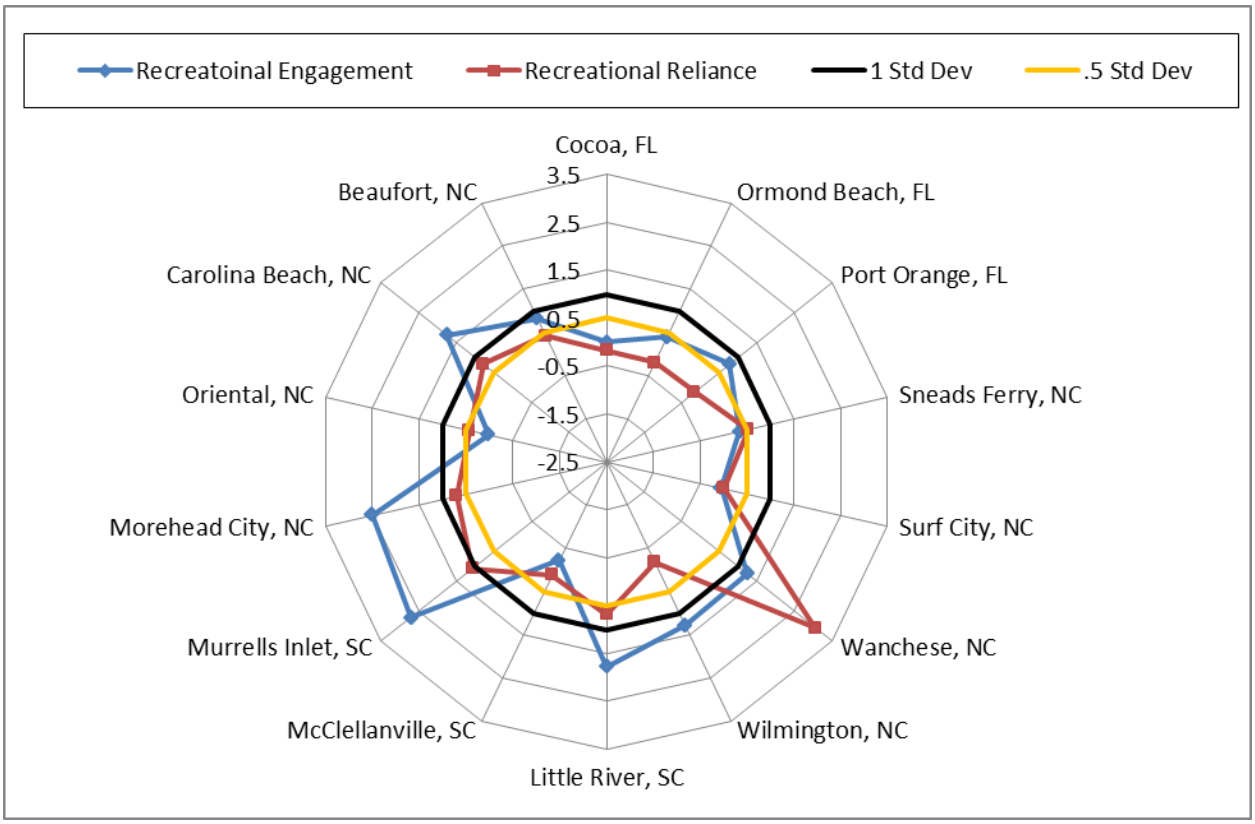

Figure 4.3.1. Recreational engagement and reliance for fourteen black sea bass fishing communities. Source: SERO Social Indicators Database 2013.

Recreational AMs can have significant direct and indirect social effects when triggered, because they can restrict harvest in the current season or subsequent seasons. While the negative effects are usually short-term, they may at times induce other indirect effects through changes in fishing behavior or business operations that could have long-term social effects. Reduced recreational fishing opportunities can change fishing behavior through species switching if the opportunity exists, which can then increase pressure on other stocks or amplify conflict. If there are no opportunities to switch species, then losses of income or fishing opportunities may occur which can act like any downturn in an economy for fishing communities affected. While these negative effects are usually short term, they may at times induce other indirect effects through the loss of fishing infrastructure that can have a lasting effect on a community.

In recent years, the low ACL in combination with the in-season closure that is currently used as a recreational AM for black sea bass (**Alternative 1, No Action**) have resulted in shorter seasons, with the 2012 recreational season closing less than four months into the fishing year. The increase in the black sea bass ACL in Regulatory Amendment 19 (SAFMC 2013f) could lengthen the recreational season, although analysis of expected effects of the increased ACL in Regulatory Amendment 19 estimate only a few additional months (at most) for recreational fishing with the new ACL. Under the continued conditions of **Alternative 1 (No Action)**, the race to fish--due to both the constrained catch limit and uncertainty of when recreational harvest will close--is expected to continue the negative impacts on recreational anglers, specifically the for-hire businesses that cannot plan trips in advance.

It is important to note that a crucial part of recreational fishing is the *opportunity* to catch fish, and for some recreational fishermen the experience of fishing (and continued opportunity for the experience) is more important than how many fish are caught on a trip. In this way, the recreational sector can be significantly impacted by changes to when or where a particular species can be caught more so than how much of the species can be caught under the ACL. Annual establishment of firm opening and closing dates for each season under **Preferred Alternative 2** and **Alternative 3** would greatly reduce the uncertainty of when recreational anglers can fish for black sea bass, either on a private boat or through a for-hire trip. This is expected to be significantly important for the for-hire businesses in that a trip could be booked in advance with no risk that recreational black sea bass harvest would be closed. Additionally, not creating set dates (**Alternative 1 (No Action)** or **Alternative 4**) could result in foregone benefits if a trip was not booked or planned for a future date but recreational harvest ended up being open at that time. In addition to benefits to clients, this reduced uncertainty would benefit business plans for charter and headboat businesses who cater to clients who wish to fish for one of the most popular species in the South Atlantic. Overall, setting a start and end date under **Preferred Alternative 2** and **Alternative 3** would reduce uncertainty and risk for the recreational sector.

It is possible that with the announcement of the start and end date for the fishing season under **Preferred Alternative 2** and **Alternative 3**, there can be substantial changes in fishing behavior as fishermen anticipate a closure and begin increasing fishing pressure, which can lead to a derby fishery or recreational harvest exceeding the ACL. However, derby conditions currently exist during the recreational black sea bass fishing season as fishermen anticipate early closures when the recreational ACL is met (**Alternative 1, No Action**). This situation is in part due to the closures in recent years, because every early closure contributes to perceptions of scarcity and competition, which will further fuel the derby behavior. Because the risk of exceeding the ACL would be lower if the ACT is used to set the close date, **Alternative 3** would be more beneficial in the long term than **Preferred Alternative 2**. The costs of possible derby fishing under **Preferred Alternative 2** or **Alternative 3** would likely be far outweighed by the benefits to the recreational sector by removing uncertainty of when fishermen can fish for black sea bass. Additionally, the negative social effects of possible derby fishing under **Preferred Alternative 2** and **Alternative 3** would not be any more significant than the social effects of the conditions under **Alternative 1 (No Action)**.

Because the payback AM would be removed in **Alternative 4**, the in-season closure currently in place would be the only mechanism to address excessive recreational harvest of black sea bass. Paybacks would likely result in even earlier closures in the subsequent season, which could produce a domino effect that could negatively impact the recreational sector in the short term and long term, but this would not be expected under **Alternative 4**. However, if continued overages occurred, these would

be expected to negatively impact the black sea bass stock, which would likely result in long-term negative impacts on future recreational fishing opportunities.

4.3.4 Administrative Effects

Preferred Alternative 2 and **Alternative 3** would add to the administrative burden compared with **Alternative 1 (No Action)**. Under **Alternative 3**, the ACT would have to be monitored in addition to the ACL (**Preferred Alternative 2**). These additional announcements could also cause confusion and pose difficulties in enforcing the regulations. Administratively, **Alternative 4** would be the least burdensome of all the alternatives under this action.

4.4 Action 4. Modify the fishing year for the black sea bass commercial sector

Alternatives* for Action 4
(preferred alternatives in **bold**)

1. No Action. The commercial fishing year begins on June 1 and ends on May 31. Pots are prohibited from November 1 through April 30. The trip limit is 1,000 pounds gw for both the pot and hook-and-line sectors.

2. The commercial fishing year begins on July 1 and ends on June 30. Pots are prohibited from November 1 through April 30. The trip limit is 1,000 pounds gw for both the pot and hook-and-line sectors.

3. (Preferred) The commercial fishing year begins on January 1 and ends on December 31. Pots are prohibited from November 1 through April 30. From May 1 to October 31, the trip limit would be 1,000 pounds gw for pots. From May 1 to December 31, the trip limit would be 1,000 pounds gw for hook-and-line sector. From January 1 to April 30, the hook-and-line sector would be restricted to a trip limit of:

3a. 100 pounds gw
3b. 200 pounds gw
3c. 300 pounds gw (Preferred).

4. The commercial fishing year begins on May 1 and ends on April 30. Pots are prohibited from November 1 through April 30. The trip limit would be 1,000 pounds gw for both the pot and hook-and-line sectors.

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

4.4.1 Biological Effects

Black sea bass harvest rates have increased in recent years, and quota closures early in the fishing season have resulted in a change in the seasonal dynamic of harvest (**Table 4.4.1** and **Figure 4.4.1**). For the 2012/2013 commercial black sea bass fishing season, the start date of the fishing year was delayed from June 1 to July 1 to allow the black sea bass pot endorsement program, implemented through Amendment 18A (SAFMC 2012a), to be effective (**Table 4.4.1**). Additionally, a recent stock assessment (SEDAR 25 Update 2013) indicates the stock is rebuilt, and the South Atlantic Council has approved Regulatory Amendment 19 (SAFMC 2013f) which increased the commercial ACL from 364,620 lbs ww to 780,020 lbs ww in 2013-2015, and 755,254 lbs ww after 2015.

An increase in exploitable population abundance, due to population recovery, might also lead to an increase in catch rate, resulting in the quota being caught more quickly. A plateau in exploitable population biomass might lead to a stabilized catch rate; coupled with an increased ACL, this could result in a longer season. These factors make it challenging to estimate when the increased commercial ACL implemented under Regulatory Amendment 19 (SAFMC 2013f), would be met.

Table 4.4.1. Commercial landings (pounds gutted weight, gw) of black sea bass during fishing years 2006-2013.

Year	Fishing Season	Total Landings (gw)	ACL (gw)	Quota %	Closure Date
2012/2013	July 1* - May 31	296,938	309,000	96.10	10/08/12
2011/2012	June 1 - May 31	369,033	309,000	119.43	07/15/11
2010/2011		409,326	309,000	132.47	10/07/10
2009/2010		337,397	309,000	109.19	12/20/09
2008/2009		395,387	309,000	127.96	05/15/09
2007/2008		298,916	423,000	70.67	

Source: SERO website accessed at:
http://sero.nmfs.noaa.gov/sustainable_fisheries/acl_monitoring/commercial_sa/historical/index.html
*The black sea bass fishing season opening was pushed back to July 1 for the 2012/2013 fishing season.

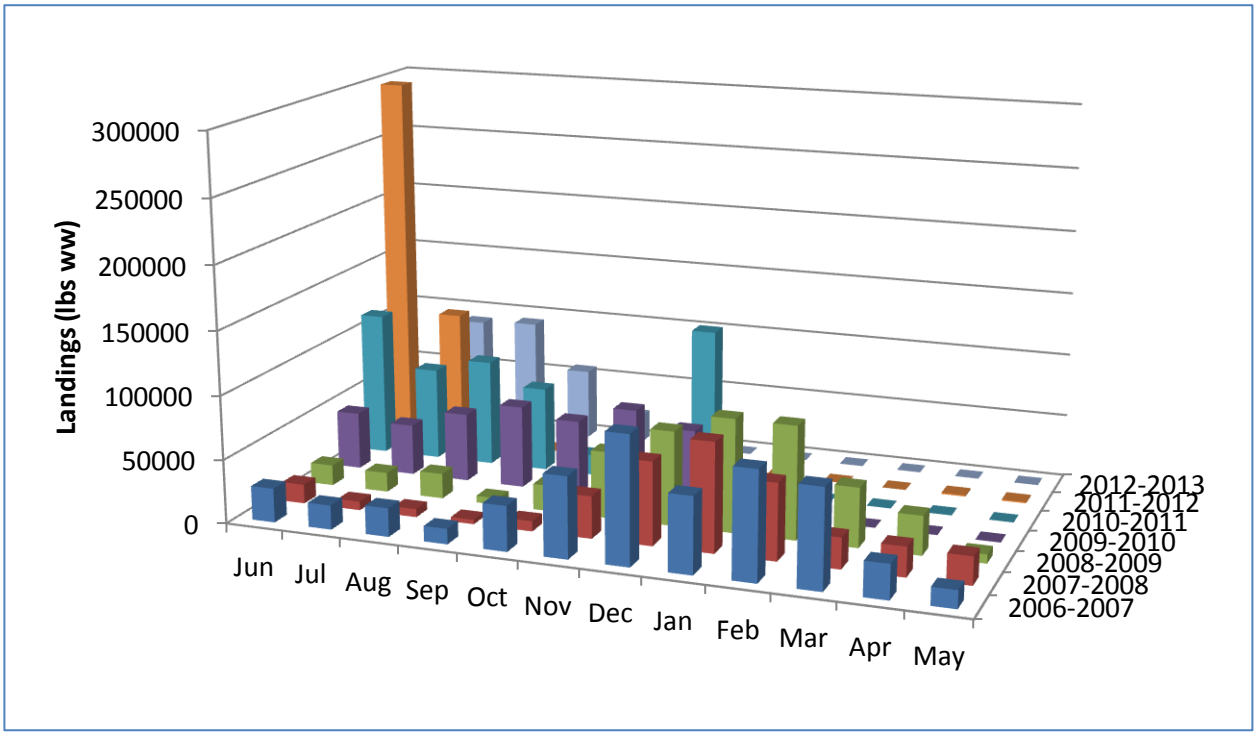

Figure 4.4.1. South Atlantic commercial harvest of black sea bass by fishing season, 2006-2013. Source: SEFSC ACL Dataset (accessed July 10, 2013).

Commercial landings were very high in June and July of 2011/2012 and 2012/2013, when compared with previous fishing seasons (**Figure 4.4.1**). Previously, state-licensed commercial harvest of black sea bass comprised <5% of the annual total. Only federally licensed commercial operators are required to submit the logbook reports that were used in the analyses described below. In the past two complete fishing seasons (2011/2012 and 2012/2013), harvest that was reported by dealers but not to federal logbooks comprised 29% and 12% of the total harvest, respectively. This was probably due the increased presence of non-federally licensed commercial operators harvesting black sea bass from state waters. The expansion factor necessary to extrapolate the impacts of logbook-simulated trap effort reductions and trip limits to these state operators is uncertain. A scalar of 12% was used, as this was the most recent value; however, uncertainty in this parameter might substantially impact the results of the analyses. If the recovery of black sea bass stock leads to higher catch per unit effort in state waters compared with previous years, these expansion factors and associated catch rates, may be underestimated. In addition, the endorsement requirement for pot gear imposed under Amendment 18A (SAFMC 2012a) appears to have substantially shifted fishing effort from pot gear to hook-and-line gear. Vertical line landings more than doubled between the 2011/2012 and 2012/2013 seasons. The simulations of black sea bass commercial harvest for this action applied commercial vertical line catch rates from the 2012/2013 season under all scenarios. If more participants shift into the vertical line sector, this would result in earlier closures than projected herein.

Table 4.4.2 shows the projected dates when the ACL would be met based on four different projection model runs (see **Appendix F** for details on the methodology). The projections are based on the ACL implemented by Regulatory Amendment 19 (SAFMC 2013f). A major point of sensitivity with the projection model runs is whether black sea bass is open when the pot gear closure becomes

effective on November 1. The vertical line catch rates are lower, so commercial harvest for black sea bass as a whole remains open longer, if it is still open by November 1.

Table 4.4.2. Projected closure dates and season length (days) for Action 4 commercial fishing season alternatives under four different projection model runs.

Alternative	PROJECTION MODEL					
	2012/13 Catch Rate	2011/12 Catch Rate	In-Season Projection	SARIMA Projection		
				L95%	MEAN	U95%
1 (No Action): June 1-May 30	No Closure	No Closure	7-May	No Closure	1-May	7-Oct
Season (days)	365	365	340	365	334	128
2: July 1-June 30	No Closure	13-Jun	7-May	31-May	3-May	5-Jan
	365	347	310	334	306	188
3c: Jan 1-Apr 30: 300 lb trip limit	**5-Nov**	**27-Oct**	**18-Sep**	**13-Oct**	**10-Sep**	**18-Aug**
	308	**299**	**260**	**285**	**252**	**229**
3b: Jan 1-Apr 30: 200-lb trip limit	7-Nov	29-Oct	19-Sep	15-Oct	11-Sep	19-Aug
	310	301	261	287	253	230
3a: Jan 1-Apr 30: 100-lb trip limit	12-Nov	3-Nov	23-Sep	19-Oct	15-Sep	22-Aug
	315	306	265	291	257	233
4: May 1-Apr 30	28-Feb	22-Jan	7-Oct	19-Nov	28-Sep	3-Sep
	303	266	159	202	150	125

Sources: SEFSC Commercial Logbook (June 2013), SEFSC ACL Commercial Data (July 2013)
The first model assumes 2012/2013 catch rates continue for the 2013/2014 season (column titled, "2012/13 Catch Rate"). A second model assumes the higher catch rates from the 2011/2012 season return (column titled, "2011/12 Catch Rate"). The third model uses a logarithmic regression of in-season catch rates to project the 2013/2014 catch rate (column titled, "In-season Projection"). The final projection model applies a Seasonal Autoregressive Integrated Moving Average (SARIMA) model to project seasonal and inter-annual dynamics in catch rate forward in time, with 95% confidence limits.
Note these model runs assume the recently increased commercial ACL of 661,034 lbs gw (Regulatory Amendment 19).

The biological effects of the alternatives for Action 4 would be similar to those for Action 2. AMs are in place to ensure ACLs are not exceeded and overfishing does not occur. Therefore, biological effects of the various alternatives would be related to fishing effort during the black sea bass spawning season, and possible incidental catch of black sea bass when harvest for co-occurring species is open, or vice-versa.

Alternative 1 (No Action) would result in commercial harvest of black sea bass lasting all of the June-May fishing year if catch rates are comparable to those observed in either 2011/2012 or 2012/2013 (**Table 4.4.2**). The final rule for Regulatory Amendment 19 (SAFMC 2013f) implemented a closure for pot gear from November 1 to April 30, therefore **Alternative 1 (No Action)** would result in the commercial season remaining open for pots until the closure. Projection model scenarios accounting for increasing catch rates in recent years indicate that the quota might be met in May. The most conservative scenario indicates the season could close as early as October.

Alternative 2 would change the start date of the commercial fishing year to July 1. Under this alternative, the ACL would not be met using 2012/2013 catch rate, and extend fishing opportunities to mid-June using the higher 2011 catch rate (**Table 4.4.2**). Projection model scenarios indicate the season could close as early as May. The most conservative scenario indicates the season could close as early as January. Since pot gear would be prohibited as of November 1, commercial fishing for black sea bass using vertical lines could continue during the months pots are closed. Similar to **Alternative 1 (No Action)**, **Alternative 2** would allow the fishing year to start after peak spawning of black sea bass.

Preferred Alternative 3 and its sub-alternatives would open the black sea bass commercial season to only the hook-and-line sector on January 1, under trip limits of 300 (**Preferred Sub-alternative 3c**), 200 (**Sub-alternative 3b**), or 100 (**Sub-alternative 3a**) lbs gw. Fishing with black sea bass pots would start on May 1, at which time the trip limit for both gear sectors would increase to 1,000 lbs gw. Use of pots would be prohibited from November 1 to April 30. Using 2012/2013 and 2011/2012 catch rates, **Preferred Alternative 3** and its sub-alternatives would result in slightly reduced (approximately 260-315 days) fishing seasons compared to **Alternative 1** (**No Action**) and **Alternative 2** (**Table 4.4.2**). Projection model scenarios indicate that the season could range from 229-291 days, with a closure between August-October. The three sub-alternatives would have similar biological effects since they do not differ by much among each other. **Sub-alternative 3a** has the lowest (100 lb gw) trip limit, and would have a slightly longer fishing season compared to **Sub-alternatives 3b** and **3c (Preferred)** (**Table 4.4.2**). **Preferred Alternative 3** and its sub-alternatives would allow black sea bass to be caught with hook-and-line gear during their spawning season in the spring; however, the magnitude of black sea bass harvest with hook-and-line gear has historically comprised around 10% of the annual commercial black sea bass landings. Furthermore, incidental catch of shallow water groupers, which are closed to harvest until May 1, could increase under this alternative. On the other hand, overlapping the black sea bass season with that of vermilion snapper would result in a decrease in black sea bass discards. The expected percent reduction in black sea bass harvest for the hook-and-line sector under each of the trip limit sub-alternatives is shown in **Table 4.4.3**. Analyses show that the current 1,000-lb trip limit does not impact harvest rate for the hook-and-line sector.

Table 4.4.3. Percent reduction in harvest of black sea bass under trip limit alternatives for hook-and-line gear from January 1 to April 30.

Fishing Year	Status Quo	**300-lb**	200-lb	100-lb
2012- 2013	0%	**18%**	24%	40%

Source: SEFSC Commercial Logbook (June 2013).

Alternative 4 would open the black sea bass commercial season to both the hook-and-line and pot sectors on May 1 and make no changes to the current trip limit. This alternative would open harvest of black sea bass with hook-and-line gear when harvest for shallow water grouper begins following the January-April spawning season closure. However, unlike **Preferred Alternative 3** and its sub-alternatives, harvest of black sea bass with hook-and-line gear would not take place at the same time as commercial harvest for vermilion snapper since Regulatory Amendment 18 (SAFMC 2013e) estimates the commercial vermilion snapper ACL would be met in March. As black sea bass are more commonly taken as incidental catch with fishermen targeting vermilion snapper than when targeting shallow water grouper species, **Alternative 4** would be less effective at reducing bycatch of black sea bass than **Preferred Alternative 3**. Also, fishing seasons would not extend as long as the other alternatives under any projection scenario (**Table 4.4.2**).

The most simplistic interpretation of the analyses would translate into **Alternative 1 (No Action)** being the most biologically beneficial among the alternatives proposed. However, there could be increased biological benefits from **Preferred Alternatives 3** (including its sub-alternatives) and **4**, which would allow fishermen to retain incidentally caught black sea bass when using hook-and-line gear.

Effective October 23, 2013, Regulatory Amendment 19 (SAFMC 2013f) prohibited the use of black bass pots November 1 through April 30 to prevent interactions between black sea bass pot gear and ESA-listed whales during large whale migrations and right whale calving season off the southeastern coast. Therefore, changing the start of the black sea bass fishing year to July as proposed under **Alternative 2**, would not be expected to have negative effects on large whales.

The South Atlantic Council, through Amendment 18A (SAFMC 2012a), implemented new regulations for the 2012/13 fishing year, which reduced potential interactions with protected species:

- Pot endorsement limited participation to 33 vessels
- Pot limit of 35 pots per vessel (total potential pots = 1,155)
- Pots must be brought back to shore after each trip
- Commercial trip limit of 1,000 lbs gw
- Increased commercial size limit from 10 inches (") total length (TL) to 11" TL
- Increased recreational size limit from 12" to 13" TL

Alternatives 1 (No Action)-4 are unlikely to have adverse effects on listed *Acropora*, large whales, or any DPS of Atlantic sturgeon. Previous ESA consultations determined the hook-and-line sector of the snapper grouper fishery (including effort targeting black sea bass), as well as the use of black sea bass pots are not likely to adversely affect *Acropora* or any DPS of Atlantic sturgeon. All of these alternatives include a seasonal pot closure during the time of year when large whales are most likely to be found in the South Atlantic. Thus, none of them is likely to cause adverse effects to whales. Regardless of the alternative selected, this action is not anticipated to increase the potential for interactions with smalltooth sawfish. Sea turtles nest along the East Coast of the United States in April-October, with peak nesting occurring in May-July. Sea turtle nesting causes gravid females to move closer to shore where they are more susceptible to interaction with snapper grouper fishing gear. Strictly based on the number of months fishing is projected to occur during sea turtle nesting season, **Sub-alternatives 3b** and **3c (Preferred)** would likely have the fewest biological benefits. Under these alternatives, fishing is projected to occur for 4-6 months of the sea turtle nesting season, including all three peak nesting months. **Sub-alternative 3a** is also likely to provide fewer biological benefits, relative to the other alternatives. Under this alternative, fishing is projected to occur for 3-6 months of the sea turtle nesting season, but during only two of the three peak nesting months. Similarly, fishing under **Alternative 4** is projected to occur for 3-5 months of the nesting season and only during two peak nesting months. **Alternative 1 (No Action)** is likely more beneficial to sea turtles because fishing under this alternative is projected to occur for four months of the sea turtle nesting season and during two peak nesting months. **Alternative 2** is likely the most biologically beneficial to sea turtles. Under this alternative, fishing is projected to only occur during only three nesting months and only one of the peak nesting months. None of the alternatives considered are expected to negatively impact or modify EFH, EFH HAPCs, or Coral HAPCs.

4.4.2 Economic Effects

The commercial black sea bass sector has seen many recent changes in management such as endorsements for pots (Amendment 18A; SAFMC 2012a), and an increase in the ACL and a pot sector closure from November through April (Regulatory Amendment 19; SAFMC 2013f). Because there have not been any seasons where all of these management measures have been in effect, it is impossible to make quantitative estimations of the effects of the alternatives and sub-alternatives of Action 4.

Alternative 1 (No Action) is not expected to have any additional economic effects as it is the status quo. The various models (excluding confidence intervals) displayed in **Table 4.4.2** estimate the commercial black sea bass season will run between 334 and 365 days given the ACL of 661,034 lbs gw (implemented through Regulatory Amendment 19, SAFMC 2013f). **Alternative 1 (No Action)** is projected to have the highest probability of not having an early closure of the season for black sea bass of any of the alternatives under consideration.

Alternative 2 lines up the start of the commercial black sea bass season with the current opening of the second vermilion snapper fishing season; however, the beginning of the vermilion snapper season is being considered for modification in Action 5 of this amendment. The purpose of having black sea bass and vermilion snapper open at the same time is to try to slow down the derby for both species and reduce discards. In 2012, the black sea bass commercial season opened on July 1, instead of June 1 because more time was necessary to institute the black sea bass pot endorsements. Therefore, there is no way to know whether the length of the commercial black sea bass fishing season in 2012 was due to a slowdown of the derby for black sea bass and vermilion snapper for the hook-and-line sector, or due to the removal of some previous participants in the black sea bass pot sector. For **Alternative 2**, the various models (excluding confidence intervals) displayed in **Table 4.4.2** estimate the commercial black sea bass season would run between 306 and 365 days given the ACL of 661,034 lbs gw (Regulatory Amendment 19, SAFMC 2013f). **Alternative 2** is projected to have the second highest probability of not having an early closure for black sea bass of any of the alternatives under consideration.

Preferred Alternative 3 would begin the fishing year on January 1. **Preferred Alternative 3** would open the fishing year during the pot closure implemented through the final rule for Regulatory Amendment 19 (November 1 through April 30). **Sub-alternatives 3a**, **3b**, and **3c (Preferred)** would require a lower hook-and-line trip limit of 100, 200, or 300 lbs gw, respectively. Allowing hook-and-line fishermen to harvest and sell black sea bass in January through April would have a positive direct economic effect. The more they are allowed to keep, the larger the economic effect. There is very little difference between the sub-alternatives of **Preferred Alternative 3** in terms of the estimated projected length of the season. For **Preferred Alternative 3**, the various models (excluding confidence intervals) displayed in **Table 4.4.2** estimate the commercial black sea bass season would run between 252 and 315 days given the ACL of 661,034 lbs gw (Regulatory Amendment 19, SAFMC 2013f). The season is predicted to close early under all of the models. **Sub-Alternatives 3a, 3b**, and **3c (Preferred)** are projected to have the second shortest season length for black sea bass of any of the alternatives and sub-alternatives under consideration in Action 4.

Alternative 4 would begin the fishing year on May 1, aligning it with the beginning of the shallow water grouper season and the end of the black sea bass pot closed period. Having the black sea bass season opening coincide with the opening of the shallow water grouper season would allow hook-and-line fishermen to keep whatever black sea bass they catch when targeting shallow water groupers which would be a direct positive economic effect for the month of May as compared to the current June 1

opening under **Alternative 1 (No Action)**. The various models (excluding confidence intervals) displayed in **Table 4.4.2** estimate the commercial black sea bass season will run between 150 and 303 days given the ACL of 661,034 lbs gw (Regulatory Amendment 19, SAFMC 2013f). For **Alternative 4**, all of the models estimate the season will close early. **Alternative 4** is projected to have the shortest season length for black sea bass of any of the alternatives and sub-alternatives under consideration in Action 4. **Table 4.4.2** models estimate **Alternative 1 (No Action)** would result in a season lasting more than twice as long as that predicted for **Alternative 4**.

Ideally, from an economic effects perspective, the season should be long enough to allow the entire ACL to be caught and at the highest ex-vessel value. **Alternative 1 (No Action)** has the highest probability of the longest season. **Alternative 4** has the highest probability of the shortest season, presumably due to the opening of commercial black sea bass in May.

During the months when the black sea bass season managed by the Mid-Atlantic Fishery Management Council (Mid-Atlantic Council) and the South Atlantic Council are both open, the probability is higher that the ex-vessel price of black sea bass will be lower. The Mid Atlantic Council's season for black sea bass closes on May 31 each year if the ACL has not yet been met. **Alternative 4**, followed by **Sub-alternatives 3a**, **3b**, and **3c (Preferred)**, has the highest probability of causing a glut in the market for black sea bass due to the predicted shorter season, resulting possibly in lower ex-vessel values that could be further exacerbated by the South Atlantic Council's black seas bass season being open while the northern black sea bass season is still ongoing.

Alternative 1 (No Action) is not expected to have additional economic effects. Given the recently proposed increased ACL for black sea bass, **Alternative 2** could see the black sea bass pot season close on November 1 each year prior to the commercial sector ACL being caught. Any alternative that would have the pot season closure go into effect prior to the commercial ACL being landed would create a direct negative economic effect to the black sea bass pot sector. However, such a scenario would create a direct positive economic effect for the hook-and-line portion of the fishery as they could continue fishing until the ACL was met. **Alternative 1 (No Action)**, **Alternative 2**, and **Alternative 4** could have higher positive economic effects for hook-and-line fishermen after November 1 each year when compared to the more restrictive hook-and-line trip limits proposed in **Sub-alternatives 3a-3c (Preferred)**. While the estimated overall length of the seasons differ very little among **Sub-alternatives 3a-3c (Preferred)**, trip costs could be affected differentially for hook-and-line fishermen. The lower the trip limit, the higher the trip costs per fish. Therefore, under **Sub-alternative 3a**, a 100-lb gw trip limit would result in the highest per fish cost, while a 300-lb gw trip limit under **Preferred Sub-alternative 3c** would result in the lowest per fish cost. Each of the sub-alternatives of **Preferred Alternative 3** may result in the same industry revenue, but lower trip limits would lower industry profits. It cannot be determined whether a longer season with a possibly higher ex-vessel price could compensate for the potential profit reduction per trip when comparing the small differences in estimated length of the seasons among **Sub-alternatives 3a-3c (Preferred)**. Conversely, due to the length of the black sea bass pot closure each year from November 1 through April 30, the higher the hook-and-line trip limit during this period, the higher the probability of negative economic effects for the pot segment of the fishery due to a larger portion ACL potentially being taken up by the hook-and-line segment. It is not possible, however, to ascertain whether potential profit increases to the hook-and-line segment would outweigh the potential profit reduction to the pot segment.

In summary, **Alternative 1 (No Action)** has the greatest potential for the longest fishing season and potential direct positive economic effects, followed by **Alternative 2**, and then **Sub-alternatives 3a**, **3b**, and **3c (Preferred)**. **Alternative 4** has the lowest probability of having direct positive economic effects due to a shortened season caused by catching the black sea bass ACL in the fewest number of days and having a higher probability of lower ex-vessel values.

4.4.3 Social Effects

In recent years, the commercial black sea bass sector has been under derby conditions resulting in early closures. The limitation on participation in the pot sector through the endorsement program implemented by Amendment 18A (SAFMC 2012a), in addition to an increase in the ACL through Regulatory Amendment 19 (SAFMC 2013f), may reduce the derby conditions and lengthen the season.

Changes in the start date for the commercial black sea bass sector could result in increased access to the resource but also more frequent right whale interaction due to a potentially longer season. However, the final rule for Regulatory Amendment 19 prohibits the use of black sea bass pots during November 1 to April 30 to prevent interaction between black sea bass pots and large whales. **Figure 3.3.6** shows the communities that would likely be affected by a change in the fishing season. The communities with high regional quotients for commercial black sea bass landings include Sneads Ferry and Wanchese in North Carolina, and Port Orange, Florida. However, changes in the season are more likely to affect Sneads Ferry and Wanchese at the community level more than Port Orange as it is not as dependent upon fishing as the former.

The possible impacts on the black sea bass pot sector of the snapper grouper fishery would primarily be associated with a closure due to right whale calving season. In recent years the commercial sector has closed before the right whales are in the South Atlantic region starting in November, but the increased ACL could extend the fishing into calving season. The pot sector closure from November 1 to April 30 in Regulatory Amendment 19 (SAFMC 2013f) could negatively impact the pot sector if the commercial ACL is not met before November 1. Therefore, any proposed alternatives that could contribute to allowing the pot fishermen to land as much of the ACL before the right whale calving season would be the most beneficial. Under this scenario, **Alternative 4** would be more beneficial to the pot fishermen than **Alternative 1 (No Action)**, **Alternative 2**, or **Preferred Alternative 3**.

For the hook-and-line sector, there may be some benefit in removing pot effort through the right whale closure under **Preferred Alternative 3** and **Alternative 4**. **Preferred Alternative 3**, which has sub-options for varying trip limits, would also have varied social effects depending upon which trip limit is chosen.

4.4.4 Administrative Effects

Alternatives 2 and **4** would not add any new administrative burdens since a fishing season is already being monitored currently under **Alternative 1** (**No Action**). **Preferred Alternative 3** and its sub-alternatives would add to the administrative burden, with costs associated with additional monitoring and enforcement of the new trip limit(s), in addition to time spent disseminating new information to the public.

4.5 Action 5. Modify the commercial fishing seasons for vermilion snapper

Alternatives* for Action 5
(preferred alternatives in **bold**)

1. **Preferred. No Action. The commercial fishing year for vermilion snapper is split into two seasons. The first season starts on January 1, and the second season starts on July 1. The ACL is divided equally between the two seasons.**

2. The commercial fishing year for vermilion snapper is split into two seasons, each with its own ACL. 100% of the new ACL implemented through Regulatory Amendment 18 is applied to the second season.
   - 2a. Second season start date = July 1.
   - 2b. Second season start date = June 1.
   - 2c. Second season start date = May 1.

3. The commercial fishing year for vermilion snapper is split into two seasons, each with its own ACL. 25% of the new ACL implemented through Regulatory Amendment 18 is applied to the first season and 75% of the new ACL implemented through Regulatory Amendment 18 is applied to the second season.
   - 3a. Second season start = July 1.
   - 3b. Second season start date = June 1.
   - 3c. Second season start date = May 1.

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

4.5.1 Biological Effects

The commercial split season quotas were first implemented for vermilion snapper through Amendment 16 to the Snapper Grouper FMP (SAFMC 2009a). The purpose of splitting the commercial season into two distinct time periods was to provide opportunities to fish for vermilion snapper throughout the South Atlantic and throughout the calendar year. Amendment 16 (SAFMC 2009a) implemented a small commercial quota based on the outcome of SEDAR 17 (SEDAR 17 2008), which indicated vermilion snapper was undergoing overfishing at that time. NMFS anticipated the commercial sector would quickly reach the small annual quota and the fishing season would close very early in the year. By dividing the commercial quota into two six-month fishing seasons, vermilion snapper fishermen were given the opportunity to fish for the species at the beginning of the year and during the summer. The divided commercial quota also provided fishermen in the northern and southern areas of the South Atlantic a chance to fish for vermilion snapper when weather conditions were favorable.

A recent update to the vermilion snapper stock assessment (SEDAR 17 Update 2012) resulted in the total ACL increasing to 1,372,000 lbs ww in 2013 and then decreasing slightly each year through 2016 when the total ACL would be 1,269,000 lbs ww (as the stock returns to SSB_{MSY}) (**Table 4.5.1**).

Table 4.5.1. ABC/ACLs and commercial split season ACLs for vermilion snapper using the current fishing season for 2013-2016 based on the recent SEDAR assessment and the South Atlantic Council/SSC-approved ABC control rule.

Year	ABC (lbs ww)	Total ACL (lbs ww)	Comm ACL (lbs ww)	Season 1 (lbs ww)	Season2 (lbs ww)
2013	1,372,000	1,372,000	932,960	466,480	466,480
2014	1,312,000	1,312,000	892,160	446,080	446,080
2015	1,289,000	1,289,000	876,520	438,260	438,260
2016	1,269,000	1,269,000	862,920	431,460	431,460

Preferred Alternative 1 (No Action) would maintain the current six-month time periods and equal quota allocations to each season (**Table 4.5.1**). **Alternative 2** and its sub-alternatives would maintain the split seasons, but allocate 100% of the increased ACL (Regulatory Amendment 18, SAFMC 2013e) to the second season, and consider modifying the start date of the second season (**Table 4.5.2**).

Table 4.5.2. ABC/ACLs and commercial split season ACLs for vermilion snapper using the current fishing season for 2013-2016 based on the recent SEDAR assessment and the South Atlantic Council/SSC-approved ABC control rule with 100% of the increase in the ACL applied to second season (**Alternative 2**).

Year	ABC (lbs ww)	Total ACL (lbs ww)	Comm ACL (lbs ww)	Season 1 (lbs ww)	Season2 (lbs ww)
2013	1,372,000	1,372,000	932,960	326,527	606,433
2014	1,312,000	1,312,000	892,160	326,527	565,633
2015	1,289,000	1,289,000	876,520	326,527	549,993
2016	1,269,000	1,269,000	862,920	326,527	536,393

NOTE: Previous total ACL was 653,045 lbs ww.

Sub-Alternative 2b would retain the start of the second season as July 1. **Sub-Alternative 2b** would divide the commercial fishing seasons into one five-month season (January-May) and one seven-month season (June-December). This would enable the second season to open at the same time as the current commercial fishing season for black sea bass. Many fishermen who fish for black sea bass also fish for vermilion snapper, and opening the two species at the same time would increase harvest efficiency of each species, potentially extend the fishing seasons, and reduce bycatch of co-occurring species.

The ACL increase during the second (and longer) commercial vermilion snapper season under **Sub-Alternative 2b** could result in increased effort and could cause the second season's ACL to be met earlier in the year compared to the status quo. In 2011, the first fishing season closed on March 10, and the second season closed on September 30. In 2012, the first fishing season closed on February 29, and the second fishing season closed on September 28.

Sub-Alternative 2c would create a four-month and an eight-month commercial season. The second fishing season would begin on May 1, the same date that shallow-water grouper opens. This could be beneficial since discards are usually reduced when more than one species is open to harvest at the same time.

Alternative 3 and its sub-alternatives would maintain the split seasons, but allocate 25% of the increased ACL (Regulatory Amendment 18, SAFMC 2013e) to the first season, and 75% of the increase to the second season (**Table 4.5.3**). The start date of the second season would be the same as under **Sub-Alternatives 2a-2c**. The same rationale used in the discussion of **Sub-alternatives 2a-2c** applies to **Sub-alternatives 3a-3c** in terms of the start date of the second fishing season.

Table 4.5.3. ABC/ACLs and commercial split season ACLs using the current fishing season for 2013-2016 based on the recent SEDAR assessment and the South Atlantic Council/SSC-approved ABC control rule. 75% of increased ACL applied to second season (**Alternative 3**).

Year	ABC (lbs ww)	Total ACL (lbs ww)	Comm ACL (lbs ww)	Season 1 (lbs ww)	Season 2 (lbs ww)
2013	1,372,000	1,372,000	932,960	396,504	536,457
2014	1,312,000	1,312,000	892,160	386,304	505,857
2015	1,289,000	1,289,000	876,520	382,394	494,127
2016	1,269,000	1,269,000	862,920	378,994	483,927

NOTE: Previous total ACL was 653,045 lbs.

Two different methods and two scenarios were used for the data analysis to predict closure dates for the two commercial fishing seasons (**Table 4.5.4**). Different methods were necessary because the two seasons displayed differences in monthly landings distributions. In Scenario 1 for Season 1, the daily catch rate (pounds landed per open day) from the most recent year with vermilion snapper open for some days in March (2011) was multiplied by the number of days in March to predict total March landings. Scenario 2 for Season 1 assumed the total monthly landings in March were the same as the total monthly landings in February 2012. The commercial sector has been closed in April since 2009 as a result of management changes from Amendment 16 (SAFMC 2009a). Therefore, predicted April landings were assumed to be the same as predicted March landings for both scenarios. For Season 1 in 2013, the commercial sector for vermilion snapper would close in April under **Preferred Alternative 1 (No Action)**, early March (**Alternative 2**), and late March under **Alternative 3** (**Table 4.5.4**). Season 2 employed a different method. In 2012, Season 2 closed on September 28 because the ACL was met. Predicted landings from September 28 to December were generated by first expanding September 2012 landings to account for the three closed days (September 28-30) using the daily catch rate from September 2012 (e.g., pounds landed divided by open days). Landings for October were predicted under two scenarios. The first scenario for Season 2 assumed the total monthly landings in October were the same as the total monthly landings in September 2012 landings. The second scenario for Season 2 assumed the total monthly landings in October were the same as the total monthly landings in August 2012 landings. Predicted November and December landings were assumed to be the same as the predicted October landings for each scenario. In 2013, the commercial sector for vermilion snapper would close as late as the end of November (under **Alternative 2**), and as early as mid-October (under **Preferred Alternative 1, No Action**), with a start date of July 1 (**Table 4.5.4**). This pattern would be consistent for the earlier start dates of June 1 and May 1, with earlier predicted closure dates corresponding to the three alternatives considered (**Table 4.5.4**).

Table 4.5.4. Predicted closure dates for both commercial fishing seasons for vermilion snapper in 2013. The predicted closure dates for Season 2 incorporate the alternatives changes to both the ACL and the start date of the season. No changes to the start date are proposed for Season 1.

Season 1						
	Preferred Alt. 1 (No Action)		Alt. 2		Alt. 3	
2013 ACL (lbs ww)	466,480		326,527		396,504	
Scenario	1	2	1	2	1	2
Closure Date	**23-Apr**	**5-Apr**	5-Mar	3-Mar	30-Mar	21-Mar
Season 2						
	Preferred Alt. 1 (No Action)		Alt. 2		Alt. 3	
2013 ACL (lbs ww)	466,480		606,433		536,457	
Scenario	1	2	1	2	1	2
July 1st Start Date	**12-Oct**	**20-Oct**	1-Nov	25-Nov	21-Oct	9-Nov
June 1st Start Date	**12-Sep**	**20-Sep**	2-Oct	26-Oct	21-Sep	10-Oct
May 1st Start Date	**12-Aug**	**20-Aug**	1-Sep	25-Sep	21-Aug	9-Sep

The biological consequences of changing split season commercial ACLs, and modifying the start of the two fishing seasons of vermilion snapper under **Alternatives 2** and **3** (and their related sub-alternatives) are likely to be negligible, since overall harvest would be limited to the sector ACL and split-season ACLs. Furthermore, AMs would be triggered if the ACLs were exceeded. With the increased ACLs implemented through the final rule for Regulatory Amendment 18 (SAFMC 2013e), the issue of discards due to early seasonal closures is highly reduced. Additionally, quota-monitoring efforts have improved over the past year, which would reduce the risk that the commercial ACL would be exceeded.

No adverse effects are expected on protected species from the alternatives (and their sub-alternatives) in this action. **Preferred Alternative 1 (No Action)** would maintain the status quo, with no changes to fishing gear or fishing practices in the commercial harvest of vermilion snapper.

4.5.2 Economic Effects

Preferred Alternative 1 (No Action) for the first season would have 100% of the ACL harvested in 98-108 days depending on the scenario (**Table 4.5.4**) and the second season would have 100% of the ACL harvested in 104-112 days. **Alternative 2** for the first season would have 100% of the ACL harvested in 62-65 days and the second season would have 100% of the ACL harvested in 124-128 days. **Alternative 3** for the first season would have 100% of the ACL harvested in 80-89 days and the second season would have 100% of the ACL harvested in 124-133 days.

In terms of economic effects, Action 5 is largely a management decision as to when the fish are to be caught. The commercial ACL has been caught each year, and the estimates provided in **Table 4.5.4** indicate that the ACLs would continue to be met no matter which alternative is chosen. As long as there are no significant fluctuations in ex-vessel price per pound for vermilion snapper, there are no differences in the economic effects for when the seasons begin, or what percentage of the overall ACL goes to either season.

4.5.3 Social Effects

Currently, the commercial sector of the vermilion snapper portion of the snapper grouper fishery exists under derby conditions in which the split quota is met and sometimes exceeded in just a few weeks. In addition to concerns about safety at sea that arise from the race to fish, the derby periods result in a large amount of vermilion snapper on the market in a very short period of time. This may cause reduced market value and lower product quality, and the bust-and-boom nature of the commercial vermilion snapper sector may hinder business stability and steady job opportunities for captain and crew.

Figure 3.3.5 shows the communities that would likely be affected by changes in the vermilion snapper season start dates and ACLs. The primary North Carolina communities that would likely be most affected on the commercial sector side include Winnabow and Shallotte in Brunswick County, and Beaufort and Morehead City in Carteret County. In South Carolina, Murrells Inlet (Georgetown County), Little River (Horry County), and Charleston and McClellanville (Charleston County) would be most likely to experience any positive or negative impacts related to the vermilion season changes. In Florida, primary communities include Mayport (Duval County) and St. Augustine (St Johns County).

In general, the longer the season can stay open, the more benefits to the commercial fleet. Additionally, a vermilion snapper season that can be open at the same time as harvest for other co-occurring species (such as black sea bass) can help reduce discards and improve efficiency of trips. Overall, it is difficult to assess whether there are substantial social effects with any of the alternatives. Again, there are tradeoffs with each alternative and sub-alternative that vary slightly. **Preferred Alternative 1 (No action)** may offer more positive social effects just from the point of stability in management but there are shorter second seasons in comparison to other alternatives. The other alternatives do provide various different lengths to the season with **Alternative 2** providing some of the longest second seasons. **Alternative 3** and it sub-alternatives offer a more even split between the seasons than **Alternative 2**, but shorter first seasons than **Preferred Alternative 1 (No Action)**.

4.5.4 Administrative Effects

None of the alternatives and sub-alternatives considered under this action would result in additional administrative burdens in the form of cost, time, or law enforcement efforts. Currently, split season commercial quotas are in place (**Preferred Alternative 1, No Action**), and ACL closures during both seasons have occurred. Even if the commercial ACLs continue to be met during each of the fishing seasons under **Alternatives 2** and **3** (and their respective sub-alternatives), the administrative resources required to implement in-season closures are minimal.

4.6 Action 6. Modify the trip limits for the commercial sector for gag

Alternatives for Action 6
(preferred alternatives in **bold**)

1. (No Action). The commercial trip limit for gag is 1,000 pounds gutted weight (lbs gw).

2. Preferred. Reduce the trip limit when 75% of the gag commercial ACL is landed.

2a. Reduce the trip limit to 100 lbs gw
2b. Reduce the trip limit to 200 lbs gw
2c. Reduce the trip limit to 300 lbs gw
2d. Reduce the trip limit to 400 lbs gw
2e. Preferred. Reduce the trip limit to 500 lbs gw

4.6.1 Biological Effects

This action proposes implementing trip limits for the commercial sector once 75% of the commercial ACL for gag is met. The current commercial ACL for gag is, 326,722 lbs gw and 75% of the ACL is 245,042 lbs gw. The ACL was reduced from 352,940 lbs gw on September 12, 2013, through the final rule for Regulatory Amendment 15 (SAFMC 2013c)

A stock assessment completed in 2006 indicated gag was experiencing overfishing and was approaching an overfished condition (SEDAR 10 2006). Amendment 16 to the Snapper Grouper FMP (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, and yellowmouth grouper; a directed commercial ACL for gag; and a reduction in the recreational bag limits for shallow water grouper species. The gag commercial sector has only been met once since it was implemented in 2009, which resulted in a closure of shallow water groupers in 2012.

Additional protection to gag has been provided in the form of ACLs and AMs. Amendment 17B to the Snapper Grouper FMP (SAFMC 2010b) established commercial and recreational ACLs and AMs for gag, and eight other species. Regulatory Amendment 15 (SAFMC 2013c), which was implemented on September 12, 2013, modified the AM to only prohibit commercial harvest of gag when the gag ACL is met or projected to be met. In addition, the final rule for Regulatory Amendment 9 (SAFMC 2011a) established a 1,000 lb gw trip limit for gag.

Annual commercial landings for gag from 2009 through 2012 are shown in **Figure 4.6.1**. Landings for 2009-2011 are from the commercial ACL dataset and landings for 2012 are from the SEFSC's Commercial Quota Monitoring System (QMS). The red dashed line represents predicted 2012 landings if the fishery was open during the entire months of October, November, and December.

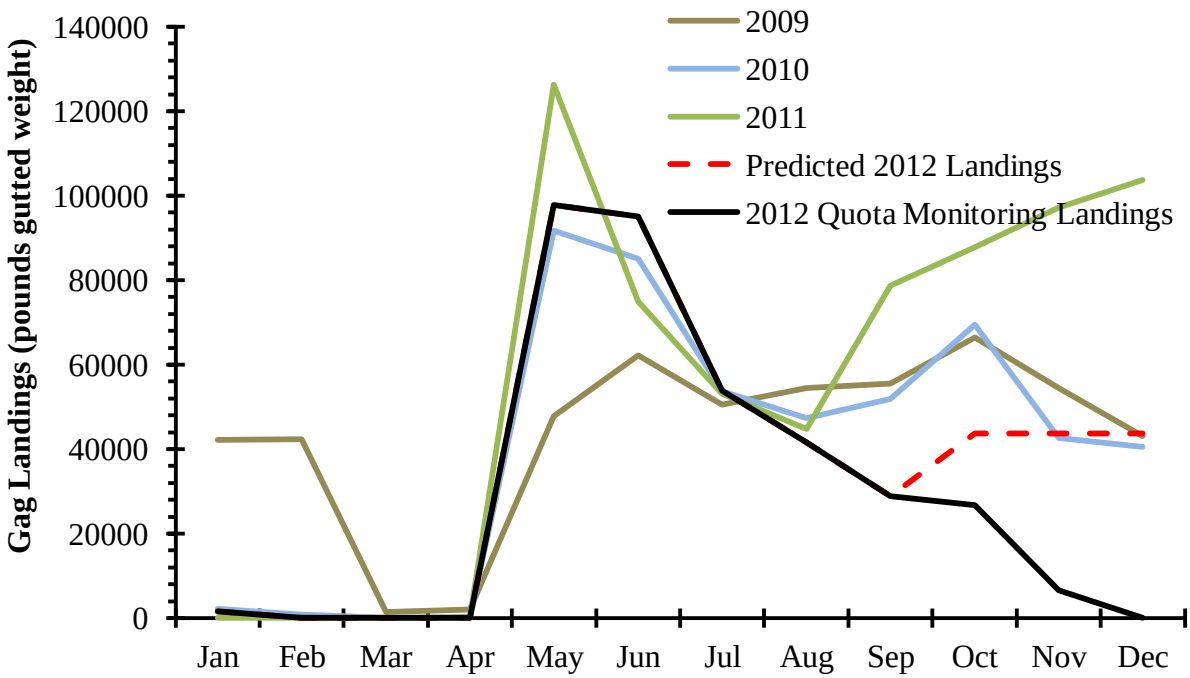

Figure 4.6.1. South Atlantic gag commercial landings by month from 2009 to 2012.
Source: NMFS SERO.

The commercial sector experienced various closures throughout the years, which impacted the landings shown in **Figure 4.6.1**. In 2009, commercial gag harvest was prohibited in March and April as a result of Amendment 9 to the Snapper Grouper FMP (SAFMC 1998), which was implemented on February 24, 1999. In 2010 and 2011, gag harvest was prohibited from January 1 to April 30 as a result of Amendment 16 (SAFMC 2009a), which was implemented on July 29, 2009. In 2012, the gag commercial sector was closed on October 20 because the gag commercial quota was projected to be met. However, the commercial sector reopened from November 13 to November 21 because the ACL had not been met.

The biological effects of **Alternatives 1 (No Action)** and **Preferred Alternative 2** (including its sub-alternatives) would be expected to be neutral because ACLs and AMs are in place to ensure overfishing does not occur. **Alternative 1 (No Action)** could present a greater biological risk to the gag stock in terms of exceeding the ACL than **Preferred Alternative 2** since no step-down trip limit would be in place to slow down the rate of harvest and help ensure the ACL is not exceeded. However, improvements have been made to the quota monitoring system, and the South Atlantic Council has approved a Dealer Reporting Amendment, which should enhance data reporting. Furthermore, AMs are in place to ensure overfishing does not occur if the ACLs are exceeded. Trip limits specified under **Preferred Alternative 2** and its sub-alternatives could provide biological benefits to the South Atlantic gag stock since the harvest would be reduced when landings were close to reaching the commercial ACL. This provision could help ensure that overages do not occur and could result in biological benefits. However, any biological benefits associated with **Preferred Alternative 2** and its sub-alternatives would be expected to be small. The ACL would be expected to be met in December with a trip limit of 100 lbs gw that would be implemented when 75% of the ACL was met (**Sub-alternative 2a**) (**Table 4.6.1**). Larger trip limits would not constrain catch and would result in the ACL being met earlier in the year. Trip limits greater than 300 lbs gw (**Sub-alternative 2c**) would have a similar effect to the status quo **Alternative 1 (No Action)**.

Table 4.6.1. Predicted closure dates for South Atlantic gag under various trip limits implemented after 75% of the ACL was reached.

Trip Limit	ACL = 326,722 lbs gw	
	2011 Data	2012 Data
	Closure Date	Closure Date
1. No trip limit	10-Sept	5-Oct
2a. 100	2-Dec	11-Dec
2b. 200	16-Oct	1-Nov
2c. 300	27-Sept	19-Oct
2d. 400	23-Sept	13-Oct
Preferred 2e. 500	**17-Sept**	**10-Oct**

Data from 2011 and 2012 were used because they are the most recent years of complete data and most likely to reflect current fishing behavior and catch rates.

Alternative 1 (No Action) and **Preferred Alternative 2** and its sub-alternatives are unlikely to have adverse effects on listed *Acropora* species, large whales, or any DPS of Atlantic sturgeon. Previous ESA consultations determined the hook-and-line sector of the snapper grouper fishery (including effort targeting gag) was not likely to adversely affect *Acropora* species, large whales, or any DPS of Atlantic sturgeon. Regardless of the alternative selected, this action is not anticipated to increase the potential for interactions with smalltooth sawfish. Sea turtles nest along the East Coast of the United States in April-October, with peak nesting occurring in May-July. Sea turtle nesting brings gravid females closer to shore where they are more susceptible to interaction with snapper grouper fishing gear. Strictly based on the number of months fishing is projected to occur during sea turtle nesting season, **Sub-alternatives 2a-2d** would all have similar biological effects. Under these alternatives, fishing is projected to occur during all six sea turtle nesting months, including all three peak nesting season months. **Preferred Sub-alternative 2e** would have slightly more biological benefit. If the earliest seasonal closure predicted occurred, fishing would only occur during 5.5 months of sea turtle nesting season. If the latest seasonal closure predicted occurred, fishing would take place during all six sea turtle nesting months. For both projected closure dates, fishing would occur during all three peak nesting months. None of the alternatives considered are expected to negatively impact or modify EFH, EFH HAPCs, or Coral HAPCs.

4.6.2 Economic Effects

The goal of **Preferred Alternative 2** is to extend the fishing year. Assuming the commercial sector ACL constrains the catch, there would be no direct positive economic effects arising from any sub-alternative under **Preferred Alternative 2** compared to **Alternative 1 (No Action)**.

Artificially lengthening seasons through the use of trip limits can have direct negative economic effects by creating a net increase in trip costs per pound of fish landed. Trip limits create economic inefficiencies. Allowing fishermen to catch more fish on a given trip tends to reduce overall trip costs per pound of fish. Having too restrictive a trip limit might have the effect of cancelling trips because the fishermen determine that such a trip is not profitable or not profitable enough to be worth the effort. That said, in general, the less restrictive the trip limit, the less the likelihood of there being direct negative economic effects. Data are not currently available to analyze which level trip limits for gag

would not be profitable. If targeted trips no longer become profitable, gag landed after 75% of the ACL has been met would be a result of bycatch from other targeted species.

Lengthening the season through instituting trip limits is not likely to increase the ex-vessel price per pound received by fishermen unless the gag season can be extended into a period where no other similar snapper grouper species are available to buyers. Therefore, while **Alternative 1 (No Action)** is not expected to change the length of the commercial fishing season, it is expected to have the least direct negative economic effect on commercial snapper grouper fishermen. **Sub-alternatives 2a** through **2e (Preferred**), in that order, would be expected to have the most to the least direct negative economic effect.

4.6.3 Social Effects

Gag is an important commercial species for several communities in North Carolina and South Carolina (**Figure 3.3.4**). Changes in the trip limits or other commercial AMs would most likely impact fishermen in Murrells Inlet and Little River (South Carolina), and the North Carolina communities of Wilmington, Hampstead, and Morehead City.

In general, a step down in a commercial trip limit may help slow the rate of harvest, lengthen a season, and prevent the ACL from being exceeded, but trip limits that are too low may make fishing trips inefficient and too costly if fishing grounds are too far away. Relative to **Alternative 1 (No Action)**, **Preferred Alternative 2, Preferred Sub-alternative 2c** would be expected to reduce the derby effects and associated negative impacts that can occur due to an in-season closure or payback provision if the ACL is exceeded. Projections of the expected season lengths under the alternative trip limits considered are provided in **Table 4.6.1**. If the longest expected season results in the greater social benefits, **Preferred Alternative 2, Preferred Sub-alternative 2a** would likely be the most beneficial to the commercial fleet in terms of lengthening the season. However, while trip limits may extend the length of the fishing season, this management measure would be expected to alter the profitability of some trips, jeopardizing normal fishing behavior, revenues, and social benefits. The potential economic effects of the proposed step-down in gag trip limits are described in **Section 4.6.2**, and in general, it is assumed for the purposes of this discussion that the greater the economic losses, the greater the social losses. Social benefits would likely be maximized as a result of some trade-off between season length and economic changes.

4.6.4 Administrative Effects

Alternative 2 (Preferred) would have increased administrative burdens when compared with **Alternative 1** (**No Action**). Additional costs would be incurred due to monitoring and enforcement of the new trip limits, in addition to time and resources spent on disseminating the new information to the public.

4.7 Action 7. Modify the recreational accountability measure for vermilion snapper

Alternatives* for Action 7
(preferred alternatives in **bold**)

5. No action. If recreational landings reach or are projected to reach the ACL, and vermilion snapper are overfished, the harvest is prohibited for the remainder of the fishing year. Without regard to overfished status, if landings exceed the ACL, the ACL for next fishing year will be reduced by the amount of the overage.

6. If recreational landings reach or are projected to reach the ACL, harvest is prohibited for the remainder of the fishing year. If landings exceed the ACL, the ACL for the following fishing year will be reduced by the amount of the overage.

7. If recreational landings reach or are projected to reach the ACL, harvest is prohibited for the remainder of the fishing year.

8. **Preferred. If recreational landings reach or are projected to reach the recreational ACL, harvest is prohibited for the remainder of the fishing year. Payback of the overage would only take place if vermilion snapper are overfished and the Total ACL is exceeded due to an overage in the recreational ACL. The amount of the overage would be deducted from the following year's recreational ACL.**

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

4.7.1 Biological Effects

Regulatory Amendment 18 (SAFMC 2013e), which was implemented on September 5, 2013, increased the recreational ACL for vermilion snapper in the South Atlantic from 307,315 lbs gw to 395,532 lbs gw (439,040 lbs ww). The new recreational ACL of 395,532 lbs gw reflects the recent update to the stock assessment, which indicates the stock is no longer undergoing overfishing and is not overfished. Regulatory Amendment 18 also eliminated the current closed recreational season from November to March. The current AM (**Alternative 1 (No Action)**) will only close the recreational sector when the recreational ACL is met and the stock is overfished. As the recent stock assessment indicates vermilion snapper is neither overfished nor undergoing overfishing, the recreational sector would not close during the fishing year if the recreational ACL was met or projected to be met under **Alternative 1 (No Action)**. Furthermore, the AM for **Alternative 1 (No Action)** makes no adjustments in the following fishing year if the ACL is exceeded. **Alternatives 2** through **4 (Preferred)** are proposed as options to ensure that the ACL is not exceeded and overfishing does not occur.

Figure 4.7.1 provides a visual representation of the landings for two scenarios to predict landings in waves 1 and 6. Scenario 1 assumed wave 1 landings were the same as wave 2, and wave 6 landings were the same as wave 5. Scenario 2 used historical proportional relationships of headboat landings for wave 1 to wave 2, and wave 6 to wave 5 to estimate wave 1 and wave 6 landings.

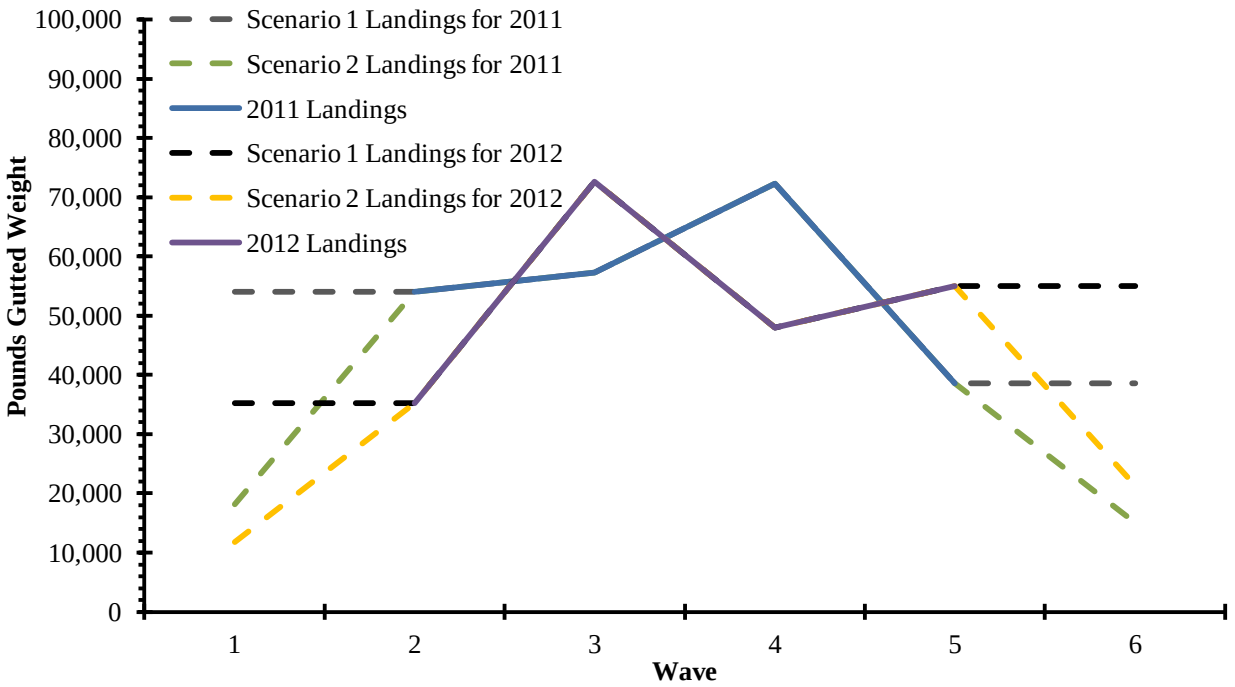

Figure 4.7.1. Recreational landings (MRIP and headboat) for vermilion snapper by wave in the South Atlantic. Waves 2 through 5 represent 2011 and 2012 recreational landings data.

Once the landings for each wave were established for each scenario, it was assumed that each month had a uniform distribution of landings for each day. The landings for each day were cumulatively summed and compared to ACLs to predict when the ACL would be met. The landings were compared to the ACL of 395,532 lbs gw (439,040 lbs ww) that was implemented through Regulatory Amendment 18 (SAFMC 2013e). Based on landings data from 2011 and 2012, the increased ACL in Regulatory Amendment 18 is not expected to be met (**Table 4.7.1**).

Table 4.7.1. Predicted annual recreational vermilion snapper landings and closure dates for two scenarios using data from 2011 and 2012.

ACL	Scenario 1		Scenario 2	
	Predicted Annual Landings (lbs gw)	Closure Date	Predicted Annual Landings (lbs gw)	Closure Date
2011 Landings	314,956	None	255,410	None
2012 Landings	300,937	None	243,894	None

The closure dates are predicted assuming landings do not exceed the ACL of 395,532 lbs gw (439,040 lbs ww).

This analysis attempted to bracket the possible range of future landings during months that are currently closed. Uncertainty exists in this projection, as economic conditions, weather events, changes in catch-per-unit effort, fisher response to management regulations, and a variety of other factors may cause departures from the predictions. A specific consideration is that South Atlantic vermilion snapper are commonly harvested with gray triggerfish, lane snapper, red porgy, and red snapper (SERO-LAPP-2010-06 2010). All of these species are managed with ACLs and red snapper has been closed since early 2010 with the exception of two weekend openings in September 2012. Management regulations on these other species, and in particular red snapper, likely affect vermilion snapper landings.

Alternative 1 (No Action) would be expected to yield the least biological benefit since it would not provide any in-season or post-season protection against overfishing. Vermilion snapper are not overfished (SEDAR 17 Update 2012) and the in-season closure would only be in effect if the stock was overfished. Although **Alternative 1 (No Action)** would reduce the ACL the following fishing year by the amount of the overage, regardless of the overfished status, there is no mechanism in place to reduce harvest when the adjusted ACL is met. Hence, **Alternative 1 (No Action)** is the least biologically beneficial to the vermilion snapper stock among the alternatives considered.

Alternative 2 is the most conservative of the alternatives since it includes both an in-season closure and a payback provision, and hence would yield the highest biological benefit relative to **Alternative 1 (No Action)**. **Alternative 3** would provide an in-season closure, but there would be no payback provision in the following fishing year if the ACL was exceeded. An in-season closure acts as a deterrent to exceeding the ACL, whereas payback provisions are enacted after the damage is already done. Therefore, **Alternative 3**, with its in-season closure would be expected to yield a higher biological benefit when compared with **Alternative 1 (No Action)**, but would have less biological benefits than **Alternative 2**.

Preferred Alternative 4 provides an in-season closure, but payback provisions would only go in effect if the species is overfished and the total ACL (commercial + recreational) is exceeded. Currently, there is no payback provision in place for the commercial sector. Payback of the amount of a recreational overage would include a deduction from the following year's recreational ACL. **Preferred Alternative 4** would result in direct biological benefits to the vermilion snapper stock relative to **Alternative 1 (No Action)** and would be the next most biologically beneficial to the vermilion snapper stock after **Alternative 2**.

No discernible effects to protected species are expected from the alternatives under this action. None of the alternatives considered are expected to negatively impact or modify EFH, EFH HAPCs, or Coral HAPCs.

4.7.2 Economic Effects

Current predictions on the recreational harvest of vermilion snapper show that the recreational ACL would likely not be reached in the near future. Thus, each AM alternative to the no action alternative would have no effects on CS and NOR in the short term.

There is always the possibility that the recreational ACL for vermilion snapper would be exceeded. If recreational landings reach or are projected to reach the recreational ACL, and in addition the recreational ACL is exceeded, the severity of effects on CS and NOR would depend on the restrictiveness of the alternatives. In this sense, **Alternative 3** would have the least adverse effects on CS and NOR and **Alternative 2** the worst adverse effects on CS and NOR. Over the long-term, the severity of the effects on CS and NOR would also depend on the sustainability of the vermilion snapper stock to support recreational fishing opportunities. In general, a more restrictive AM would have a higher probability of protecting the stock over the long term, so in this sense the recreational sector would be better off in the long term with **Alternative 2**, followed by **Preferred Alternative 4**, and then by **Alternative 3**.

In the absence of estimates of mid-term and long-term effects on CS and NOR, it is not possible to determine which alternative would provide the best net effects over time. It may only be noted that actual balancing of the mid-term and long-term effects on CS and NOR would partly depend on how fast management can react to the changing status of the stock. This, in turn, would partly depend on timely knowledge of the status of the stock over time.

4.7.3 Social Effects

Recreational AMs can have significant direct and indirect social effects when triggered, because they can restrict harvest in the current season or subsequent seasons. While the negative effects are usually short-term, they may at times induce other indirect effects through changes in fishing behavior or business operations that could have long-term social effects. Some of those effects are similar to other thresholds being met and may involve switching to other species or discontinuing fishing altogether. Those restrictions usually translate into reduced opportunity for harvest, which in turn can change fishing behaviors through species switching if the opportunity exists. That behavior can increase pressure on other stocks or amplify conflict. If there are no opportunities to switch species, then losses of income or fishing opportunities may occur which can act like any downturn in an economy for fishing communities affected. If there is a substantial downturn, then increased unemployment and other disruptions to the social fabric may occur. While these negative effects are usually short term, they may at times induce other indirect effects through the loss of fishing infrastructure that can have a lasting effect on a community.

In general, the most long-term benefits for the stock and for sustainable recreational fishing opportunities, is a combination of an in-season closure and a payback provision. However, some flexibility in how these AMs are triggered can help to mitigate the negative short-term impacts on the recreational sector. **Alternative 1 (No Action)** includes both an in-season closure and payback but with the in-season closure occurring if the species is overfished, which could trigger a payback without the ability to slow or stop harvest. **Alternative 2** would provide both an in-season closure and a payback provision if the recreational sector ACL was exceeded. **Preferred Alternative 4** would allow the payback only if the total ACL is exceeded, which provides some flexibility to the recreational sector if a portion of the commercial ACL is not used. **Alternative 3** would not include a payback provision, which could have longer-term impacts if the recreational ACL is exceeded several years in a row.

4.7.4 Administrative Effects

Alternatives 2 through **4 (Preferred)** fall within the scope and capacity of the current management system, which monitors ACLs and closes fisheries as ACLs are met. These alternatives are not expected to significantly affect the administrative environment.

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

5.1 Action 1. Modify the commercial and recreational fishing years for greater amberjack

Alternatives for Action 1
(preferred alternatives in **bold**)

7. (No Action). The current commercial and recreational fishing years begin on May 1 and end on April 30.

8. Modify the commercial and recreational fishing years for greater amberjack to begin on January 1 and end on December 31.

9. Preferred. Modify the commercial and recreational fishing years for greater amberjack to begin on March 1 and end on February 28.

Snapper Grouper Advisory Panel (AP) Comments and Recommendations

The AP recommended **Alternative 1 (No Action)** as a preferred. AP members stated that they felt a year or two should go by to see the effects of current management on the greater amberjack stock. They were concerned that if the fishing year were to change, there could be some fishing pressure during the spawning season in May. AP members did acknowledge that a positive outcome of changing the start of the fishing year to January 1 would be the certainty of being able to catch amberjack early in the year when not many other snapper grouper species can be harvested.

Law Enforcement Advisory Panel (LEAP) Comments and Recommendations

The LEAP received an update on actions and alternatives being considered at their February 2013 meeting. The LEAP had no concerns or recommendations for any of the actions contained in the amendment. The LEAP received the completed draft amendment via e-mail on August 27, 2013, with a request for comments. None were received.

Scientific and Statistical Committee (SSC) Comments and Recommendations

The SSC reviewed some of the analyses for Regulatory Amendment 14 in April 2013. The SSC made the following recommendation:

The SSC noted that not all the proposed changes provide socioeconomic benefits. It doesn't seem possible to get a good grasp on the actual socioeconomic benefits to the entire fishery when there are some people for and some opposed to these changes. Due to the schedule and amount of analyses required the SSC requests a final opportunity to review this amendment after analyses are completed. Specifically, the Committee suggests that the SEP be given the opportunity to review in more detail by e-mail.

Additionally, the SSC recommends that socioeconomic issues of this nature be prioritized in the Council's research priority plan given the increased need for this type of information and the high degree of uncertainty in socioeconomic analysis due to short timelines with regulatory amendment preparation as well as the relatively large number of changes in the management process.

South Atlantic Fishery Management Council's (South Atlantic Council) Choice for Preferred Alternative

At their June 2013 meeting, the South Atlantic Council selected **Alternative 2** as the preferred and approved the amendment for a round of public hearings in August 2013. The public was supportive of the proposed change and no opposition or concerns were raised during the hearings. However, during discussion of this amendment at the September 2013 South Atlantic Council meeting, members were divided on which alternative would be the best choice for the fishery. Some South Atlantic Council members argued that it is important for greater amberjack to be available commercially in the Carolinas during the fall months, when other species such as gag may be closed, and hence were supportive of taking no action to change the fishing year. Other South Atlantic Council members explained that greater amberjack are extremely important to South Florida during March to May of each year, before they migrate north in the late spring, and expressed strong support for **Alternative 2**. Further, they stated that out of those three months, restrictions on sale are in place during the month of April when greater amberjack are spawning. Hence, the fish are only available to commercial fishermen in South Florida for two months out of the year whereas fishermen in North Florida, Georgia, and the Carolinas can harvest them for a much longer period of time. A motion was offered to select **Alternative 1 (No Action)** as the preferred, and follow the recommendation of the Snapper Grouper AP. South Atlantic Council members declared that this situation is yet another example that supports a regional management approach for many of the economically important species in the South Atlantic or, at the very least, the adoption of split seasons that would satisfy the needs of fishermen throughout the region. A substitute motion to select **Alternative 3** as the preferred was then offered and was approved. The alternative would change the fishing year for both sectors to begin on March 1. This represented a compromise between a May 1 and a January 1 start date and thus is expected to address the needs of fishermen at the extremes of the South Atlantic Council's area of jurisdiction.

The South Atlantic Council concluded **Preferred Alternative 3** best meets the purpose of enhancing economic yield from harvest of greater amberjack. Further, **Preferred Alternative 3** enhances socioeconomic benefits to fishermen and fishing communities that utilize the greater amberjack resource. **Preferred Alternative 3** 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. Modify the fishing year for the black sea bass recreational sector

Alternatives for Action 2
(preferred alternatives in **bold**)

11. No Action. The recreational fishing year for black sea bass begins on June 1 and ends on May 31.
12. Modify the recreational fishing year for black sea bass to begin on January 1 and end on December 31.
13. **Preferred. Modify the recreational fishing year for black sea bass to begin on April 1 and end on March 31.**
14. Modify the recreational fishing year for black sea bass to begin on October 1 and end on September 30.
15. Modify the recreational fishing year for black seas bass to begin on May 1 and end on April 30.

Snapper Grouper AP Comments and Recommendations

The AP recommended a start date of April 1 for the recreational black sea bass fishing year (**Alternative 3**). The rationale behind their recommendation was to make the start date coincide with the opening of recreational fishing for vermilion snapper and thus minimize the amount of discards.

Law Enforcement AP Comments and Recommendations

The LEAP received an update on actions and alternatives being considered at their February 2013 meeting. The LEAP had no concerns or recommendations for any of the actions contained in the amendment. The LEAP received the completed draft amendment via e-mail on August 27, 2013, with a request for comments. None were received.

SSC Comments and Recommendations

The SSC reviewed some of the analyses for Regulatory Amendment 14 in April 2013. The SSC made the following recommendation:

The SSC noted that not all the proposed changes provide socioeconomic benefits. It doesn't seem possible to get a good grasp on the actual socioeconomic benefits to the entire fishery when there are some people for and some opposed to these changes. Due to the schedule and amount of analyses required the SSC requests a final opportunity to review this amendment after analyses are completed. Specifically, the Committee suggests that the SEP be given the opportunity to review in more detail by e-mail.

Additionally, the SSC recommends that socioeconomic issues of this nature be prioritized in the Council's research priority plan given the increased need for this type of information and the high degree of uncertainty in socioeconomic analysis due to short timelines with regulatory amendment preparation as well as the relatively large number of changes in the management process.

South Atlantic Council's Choice for Preferred Alternative

At their June 2013 meeting, the South Atlantic Council selected **Alternative 3** (April 1 start date for the recreational sector) as their preferred. During public hearings held in August 2013, the majority of stakeholders supported that alternative, which would implement an April 1 start date for the recreational sector. However, there were suggestions to consider different start dates such as March 1 or May 1. The intent of the change in fishing year is to decrease the amount of regulatory discards by "lining up" the seasons for species that are commonly caught together, such as black sea bass and vermilion snapper.

Given that Regulatory Amendment 18 recently removed the annual November-April recreational closure for vermilion snapper, there was more interest in an April 1 start date for recreational black sea bass.

The South Atlantic Council concluded **Preferred Alternative 3** best addresses the need to allow harvest of black sea bass at the same time as that of co-occurring species to minimize the amount of regulatory discards. Further, **Preferred Alternative 3** enhances socioeconomic benefits to fishermen and fishing communities that utilize the black sea bass resource. **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.

5.3 Action 3. Modify the recreational accountability measure for black sea bass

Alternatives* for Action 3
(preferred alternatives in **bold**)

1. No Action. If the ACL is met or is projected to be met, independent of stock status, prohibit the harvest and retention of black sea bass. If the ACL is exceeded, reduce the recreational ACL in the following season by the amount of the overage.

2. (Preferred) NMFS will annually announce the recreational fishing season start and end dates. The fishing season will start on April 1 and end on the date NMFS projects the ACL will be met.

3. NMFS will annually announce the recreational fishing season start and end dates. The fishing season will start on April 1 and end on the date NMFS projects the ACT will be met.

4. If the ACL is met or is projected to be met, independent of stock status, prohibit the harvest and retention of black sea bass.

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

Snapper Grouper AP Comments and Recommendations

This action was added to the amendment after the Snapper Grouper AP had already met to review the amendment. Consequently, the AP did not have a recommendation.

Law Enforcement AP Comments and Recommendations

The LEAP received an update on actions and alternatives being considered at their February 2013 meeting. The LEAP had no concerns or recommendations for any of the actions contained in the amendment. The LEAP received the completed draft amendment via e-mail on August 27, 2013, with a request for comments. None were received.

SSC Comments and Recommendations

The SSC reviewed some of the analyses for Regulatory Amendment 14 in April 2013. The SSC made the following recommendation:
The SSC noted that not all the proposed changes provide socioeconomic benefits. It doesn't seem possible to get a good grasp on the actual socioeconomic benefits to the entire fishery when there are some people for and some opposed to these changes. Due to the schedule and amount of analyses required the SSC requests a final opportunity to review this amendment after analyses are completed. Specifically, the Committee suggests that the SEP be given the opportunity to review in more detail by e-mail.

Additionally, the SSC recommends that socioeconomic issues of this nature be prioritized in the Council's research priority plan given the increased need for this type of information and the high degree of uncertainty in socioeconomic analysis due to short timelines with regulatory amendment preparation as well as the relatively large number of changes in the management process.

South Atlantic Council's Choice for Preferred Alternative

During the August 2013 round of public hearings for this amendment, there was generally little support among fishermen for establishing a fixed recreational season for black sea bass as proposed in **Preferred Alternative 2** and **Alternative 3**. Some for-hire fishermen were in favor of a fixed recreational season; however, most fishermen expressed support for **Alternative 4** (removal of the payback provision for the recreational sector).

South Atlantic Council members were in support of removing the payback provision since the black sea bass stock has been rebuilt. In addition, the South Atlantic Council reasoned that the public's opposition to a fixed season may have been because **Preferred Alternative 2** and **Alternative 3** do not propose a fixed season since adjustments would be made on the length of the following year's season based on the previous year's landings.

South Atlantic Council members discussed the need to bring more stability to the recreational sector in the South Atlantic. Recreational landings can fluctuate widely from wave to wave, thus interjecting volatility into the system. In selecting **Preferred Alternative 2**, the South Atlantic Council believes it is improving management for the recreational sector. Ultimately, the South Atlantic Council would like to explore setting recreational seasons at three-year intervals. If the recreational catches are within the estimates' confidence intervals (CI), then no management changes would be needed. If catches fall consistently outside the CIs, then adjustments would be made. The South Atlantic Council sees this approach as a better way to utilize the Marine Recreational Information Program (MRIP)'s catch estimates to track recreational data for stocks that are rebuilt. South Atlantic Council members also discussed the need to be consistent in setting accountability measures (AMs) for all managed species and including provisions that address the needs of stocks that are overfished, undergoing overfishing, or at different stages of rebuilding.

The South Atlantic Council's intent in selecting **Preferred Alternative 2** as the preferred is for the National Marine Fisheries Service (NMFS) to announce the end date of the black sea bass recreational season before the start of the fishing year on April 1 based on projected catch.

The South Atlantic Council concluded **Preferred Alternative 2** best addresses the need to allow harvest of black sea bass at the same time as that of co-occurring species to minimize the amount of regulatory discards. Further, **Preferred Alternative 2** enhances socioeconomic benefits to fishermen and fishing communities that utilize the black sea bass 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 Act and other applicable law.

5.4 Action 4. Modify the fishing year for the black sea bass commercial sector

Alternatives* for Action 4
(preferred alternatives in **bold**)

1. No Action. The commercial fishing year begins on June 1 and ends on May 31. Pots are prohibited from November 1 through April 30. The trip limit is 1,000 pounds gw for both the pot and hook-and-line sectors.

2. The commercial fishing year begins on July 1 and ends on June 30. Pots are prohibited from November 1 through April 30. The trip limit is 1,000 pounds gw for both the pot and hook-and-line sectors.

3. (Preferred) The commercial fishing year begins on January 1 and ends on December 31. Pots are prohibited from November 1 through April 30. From May 1 to October 31, the trip limit would be 1,000 pounds gw for pots. From May 1 to December 31, the trip limit would be 1,000 pounds gw for hook-and-line sector. From January 1 to April 30, the hook-and-line sector would be restricted to a trip limit of:

3a. 100 pounds gw
3b. 200 pounds gw
3c. 300 pounds gw (Preferred).

4. The commercial fishing year begins on May 1 and ends on April 30. Pots are prohibited from November 1 through April 30. The trip limit would be 1,000 pounds gw for both the pot and hook-and-line sectors.

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

Snapper Grouper AP Comments and Recommendations

One AP member recommended keeping the June 1 start date of the commercial fishing year because black sea bass harvest in the Mid-Atlantic is usually closed by then creating an exceptionally strong market. The same individual expressed that if commercial harvest of black sea bass were to begin in the Mid-Atlantic and the South Atlantic at the same time, it would be an economic disaster.

The AP engaged in lengthy discussion on the benefits of a January 1 start date with a bycatch allowance for the hook-and line sector until harvest of black sea bass with pots was open. The main benefit of this approach would be to allow commercial harvest of black sea bass and vermilion snapper at the same time. Also, the trip limit would help commercial fishermen during March and April, when other snapper grouper species are closed. A January 1 fishing year start date would also provide additional data from winter months for stock assessment efforts. The AP ultimately recommended **Alternative 3** but with a 100-pound gutted weight (lb gw) trip limit instead of the 50 lb gw trip originally proposed. In addition, some AP members stated their desire for the South Atlantic Council to consider separating the commercial annual catch limit (ACL) between the pot and hook-and-line sectors. The intent would be to avoid market flooding and extend the fishing season.

Law Enforcement AP Comments and Recommendations

The LEAP received an update on actions and alternatives being considered at their February 2013 meeting. The LEAP had no concerns or recommendations for any of the actions contained in the amendment. The LEAP received the completed draft amendment via e-mail on August 27, 2013, with a request for comments. None were received.

SSC Comments and Recommendations

The SSC had the opportunity to review some of the analyses for Regulatory Amendment 14 in April 2013. The SSC made the following recommendation:

The SSC noted that not all the proposed changes provide socioeconomic benefits. It doesn't seem possible to get a good grasp on the actual socioeconomic benefits to the entire fishery when there are some people for and some opposed to these changes. Due to the schedule and amount of analyses required the SSC requests a final opportunity to review this amendment after analyses are completed. Specifically, the Committee suggests that the SEP be given the opportunity to review in more detail by e-mail.

Additionally, the SSC recommends that socioeconomic issues of this nature be prioritized in the Council's research priority plan given the increased need for this type of information and the high degree of uncertainty in socioeconomic analysis due to short timelines with regulatory amendment preparation as well as the relatively large number of changes in the management process.

South Atlantic Council's Choice for Preferred Alternative

The public expressed strong support for "lining up" seasons to minimize discards of co-occurring species. Most fishermen supported the changes to the commercial fishing year for black sea bass under **Alternative 3** with a 300 lbs gw trip limit for the hook-and-line sector from January 1 to April 30. One individual stated that May is an important month for spawning based on scientific research. Further, due to the increase in the ACL, hook and line fishermen should have a lot of fish left to harvest after the closure for pots. Therefore, the individual recommended that the South Atlantic Council consider **Alternative 1 (No Action)** at this time and see how the increase in the ACL affects the fishery before considering modifying the commercial fishing year.

South Atlantic Council members stated that **Alternative 3** would help to stretch out the vermilion snapper fishing season since fishermen would be targeting both species at the beginning of the year instead of focusing on vermilion snapper alone. In addition, 300 lbs gw was considered an adequate trip limit based on public input and South Atlantic Council members' own experiences of fishing for black sea bass with hook and line.

The South Atlantic Council concluded **Preferred Alternative 3** best addresses the need to allow harvest of black sea bass at the same time as co-occurring species to minimize the amount of regulatory discards. Further, **Preferred Alternative 3** enhances socioeconomic benefits to fishermen and fishing communities that utilize the black sea bass resource. **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.

5.5 Action 5. Modify the commercial fishing seasons for vermilion snapper

Alternatives for Action 5*

(preferred alternatives in **bold**)

1. **Preferred. No Action. The commercial fishing year for vermilion snapper is split into two seasons. The first season starts on January 1, and the second season starts on July 1. The ACL is divided equally between the two seasons.**

2. The commercial fishing year for vermilion snapper is split into two seasons, each with its own ACL. 100% of the new ACL implemented through Regulatory Amendment 18 is applied to the second season.
   - 2a. Second season start date = July 1.
   - 2b. Second season start date = June 1.
   - 2c. Second season start date = May 1.

3. The commercial fishing year for vermilion snapper is split into two seasons, each with its own ACL. 25% of the new ACL implemented through Regulatory Amendment 18 is applied to the first season and 75% of the new ACL implemented through Regulatory Amendment 18 is applied to the second season.
   - 3a. Second season start = July 1.
   - 3b. Second season start date = June 1.
   - 3c. Second season start date = May 1.

*See Chapter 2 for a more detailed description of the

Snapper Grouper AP Comments and Recommendations

After discussing the management approaches that would benefit different areas in the region, the AP settled on recommending a 50/50 split of the ACL increase for vermilion snapper and no change in the configuration of the split season (**Alternative 1, No Action**). AP members considered at length what would work best for the Carolinas, Georgia, and Florida and concluded that the best approach would be an equitable distribution of the resource.

Law Enforcement AP Comments and Recommendations

The LEAP received an update on actions and alternatives being considered at their February 2013 meeting. The LEAP had no concerns or recommendations for any of the actions contained in the amendment. The LEAP received the completed draft amendment via e-mail on August 27, 2013, with a request for comments. None were received.

SSC Comments and Recommendations

The SSC had the opportunity to review some of the analyses for Regulatory Amendment 14 in April 2013. The SSC made the following recommendation:

The SSC noted that not all the proposed changes provide socioeconomic benefits. It doesn't seem possible to get a good grasp on the actual socioeconomic benefits to the entire fishery when there are some people for and some opposed to these changes. Due to the schedule and amount of analyses required the SSC requests a final opportunity to review this amendment after analyses are completed. Specifically, the Committee suggests that the SEP be given the opportunity to review in more detail by e-mail.

Additionally, the SSC recommends that socioeconomic issues of this nature be prioritized in the Council's research priority plan given the increased need for this type of information and the high degree of uncertainty in socioeconomic analysis due to short timelines with regulatory amendment preparation as well as the relatively large number of changes in the management process.

South Atlantic Council's Choice for Preferred Alternative

At their March 2013 meeting, during discussion of Regulatory Amendment 18, the Snapper Grouper Committee discussed introducing a new trip limit alternative that would address the needs of larger vessels: first season trip limit = 1,500 lbs gw and second season trip limit = 1,000 lbs gw. The rationale was that during the first half of the year there is little to fish for except vermilion snapper (shallow water groupers are closed from January to April) and large vessels cannot make a profit on a 1,000 lbs gw trip limit. If the trip limit in the first season was left at 1,500 lbs gw, then large vessels could derive a small profit. During the second commercial season, several other species would be available to harvest so a 1,000 lbs gw trip limit on vermilion snapper would be feasible. Also, if the trip limit during the second season were 1,000 lbs gw, then regulatory discards would diminish. Therefore, this alternative would split the difference between trying to keep the trips profitable when there is not much else to harvest and stretching the season in the second half of the year to lessen bycatch issues.

Committee members that opposed adding the alternative stated that they had received positive feedback from fishermen regarding the reduction to 1,000 lbs gw since they felt it would alleviate derby conditions and lengthen the season. The South Atlantic Council recognized the reduction in the commercial vermilion snapper trip limit would negatively impact larger vessels and vessels that make longer trips. Based on commercial logbook data for 2012 (see Regulatory Amendment 18 Appendix G, Table 1), approximately 17% of the trips exceeded 1,000 lbs gw in January and 13% in February. These vessels would have the opportunity to make additional trips to make up for the lost catch, but they would also experience increased costs for those additional trips. The trip limit and the step down would slow harvest and increase the ability to track commercial landings and close the commercial fishery without exceeding the commercial ACL. The South Atlantic Council concluded the benefits of slowing harvest with the lower trip limit and the step-down outweighed the increased costs. The South Atlantic Council ultimately chose **Alternative 3** as the preferred (1,000 lbs gw with a step down to 500 when 75% of the ACL is met) and voted to place the newly proposed alternative in Appendix A of Regulatory Amendment 18 because of the extensive support from fishermen and from the Snapper Grouper AP for the preferred alternative. The Committee then approved moving the action to modify the commercial seasons for vermilion snapper to Regulatory Amendment 14.

During public hearings for this amendment, however, there was little support for re-structuring the commercial seasons for vermilion snapper. The South Atlantic Council, therefore, based on the recommendation of the Snapper Grouper Advisory Panel and comments from the public, voted to take no action to modify the commercial seasons for vermilion snapper. The South Atlantic Council concluded **Preferred Alternative 1 (No Action)** best addresses the need to allow harvest of co-occurring species to minimize regulatory discards. Further, **Preferred Alternative 1 (No Action)** promotes an equitable distribution of the resource to fishermen throughout the South Atlantic Council's area of jurisdiction, and enhances socioeconomic benefits to fishermen and fishing communities that utilize the vermilion snapper resource. **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.

5.6 Action 6. Modify the trip limit for the commercial sector for gag

Alternatives for Action 6
(preferred alternatives in **bold**)

1. (No Action). The commercial trip limit for gag is 1,000 pounds gutted weight (lbs gw).

2. Preferred. Reduce the trip limit when 75% of the gag commercial ACL is landed.

2a. Reduce the trip limit to 100 lbs gw
2b. Reduce the trip limit to 200 lbs gw
2c. Reduce the trip limit to 300 lbs gw
2d. Reduce the trip limit to 400 lbs gw
2e. Preferred. Reduce the trip limit to 500 lbs gw

Snapper Grouper AP Comments and Recommendations

The Snapper Grouper AP recommended that the commercial trip limit for gag be reduced to 300 lbs gw once 75% of the ACL is met or projected to be met (**Sub-alternative 2c**). The alternative was initially included under this action based on a recommendation from the AP. The intent of their recommendation was to allow for a longer season and minimize the amount of discards when fishermen target other shallow water grouper species.

Law Enforcement AP Comments and Recommendations

The LEAP received an update on actions and alternatives being considered at their February 2013 meeting. The LEAP had no concerns or recommendations for any of the actions contained in the amendment. The LEAP received the completed draft amendment via e-mail on August 27, 2013, with a request for comments. None were received.

SSC Comments and Recommendations

The SSC had the opportunity to review some of the analyses for Regulatory Amendment 14 in April 2013. The SSC made the following recommendation:

The SSC noted that not all the proposed changes provide socioeconomic benefits. It doesn't seem possible to get a good grasp on the actual socioeconomic benefits to the entire fishery when there are some people for and some opposed to these changes. Due to the schedule and amount of analyses required the SSC requests a final opportunity to review this amendment after analyses are completed. Specifically, the Committee suggests that the SEP be given the opportunity to review in more detail by e-mail.

Additionally, the SSC recommends that socioeconomic issues of this nature be prioritized in the Council's research priority plan given the increased need for this type of information and the high degree of uncertainty in socioeconomic analysis due to short timelines with regulatory amendment preparation as well as the relatively large number of changes in the management process.

South Atlantic Council's Choice for Preferred Alternative

The South Atlantic Council did not consider including alternatives that would impose a step-down trip limit once a higher percentage of the ACL was landed because NMFS has previously stated that predicting when landings would be very close to meeting an ACL is difficult and very uncertain and there have been difficulties with monitoring a small amount of a remaining quota. Furthermore, the alternatives considered under this action are similar to other trip limit step-downs that have been in place for other snapper grouper species (e.g., golden tilefish). The South Atlantic Council chose to select **Sub-**

alternative 2d (trip limit step down to 300 lbs gw when 75% of the ACL is met) as the preferred to go out to public hearings based on the recommendation from the Snapper Grouper AP.

At their September 2013 meeting, the South Atlantic Council discussed that the original intent of this action, as proposed by the Snapper Grouper Advisory Panel, was to reduce discards of gag when fishermen target shallow water groupers or other species that co-occur with gag. The outcome of a step-down reduction, however, depends on how fishermen's behavior is affected: if the trip limit is still high enough to be profitable and fishermen continue to target gag, then the effect on diminishing bycatch mortality of gag is less. At the same time, South Atlantic Council members stated concern about big vessels that incur a larger cost to go fishing than smaller vessels. With the recently implemented trip limit step down for vermilion snapper and the proposed step-down for gag in this amendment, larger vessels could experience economic hardship. South Atlantic Council members also expressed concern about a low trip limit preventing fishermen from landing the entire ACL if the 75% trigger occurs late in the year. However, while this situation is theoretically possible, it is not likely given the recent and forecast performance of the fishery. In view of these issues, and since analyses showed little difference in the expected length of the season under the various trip limit alternatives, the South Atlantic Council selected **Alternative 2, Preferred Sub-alternative 2e** (trip limit step-down to 500 lbs gw when 75% of the ACL is met) as their preferred. Still, some South Atlantic Council members opposed implementing a trip-limit step down on the basis of whether it is advantageous for larger vessels stating that smaller vessels are at a disadvantage when it comes to weather and, therefore, the South Atlantic Council should adhere to the original intent of the action to create a bycatch allowance for gag. The South Atlantic Council ultimately considered imposing a trip limit step down as a temporary compromise while better ways to address discards while enhancing economic profitability, and attempting to have year-round fishing seasons, are explored.

The South Atlantic Council concluded **Preferred Alternative 2, Preferred Sub-alternative 2e**, best addresses the need to minimize regulatory discards of gag. Further, **Preferred Alternative 2, Preferred Sub-alternative 2e** minimizes socioeconomic impacts to fishermen and fishing communities that utilize the gag resource. **Preferred Alternative 2, Preferred Sub-alternative 2e** 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.

5.7 Action 7. Modify the recreational accountability measure for vermilion snapper

Alternatives* for Action 7
(preferred alternatives in **bold**)

9. No action. If recreational landings reach or are projected to reach the ACL, and vermilion snapper are overfished, the harvest is prohibited for the remainder of the fishing year. Without regard to overfished status, if landings exceed the ACL, the ACL for next fishing year will be reduced by the amount of the overage.

10. If recreational landings reach or are projected to reach the ACL, harvest is prohibited for the remainder of the fishing year. If landings exceed the ACL, the ACL for the following fishing year will be reduced by the amount of the overage.

11. If recreational landings reach or are projected to reach the ACL, harvest is prohibited for the remainder of the fishing year.

12. **Preferred. If recreational landings reach or are projected to reach the recreational ACL, harvest is prohibited for the remainder of the fishing year. Payback of the overage would only take place if vermilion snapper are overfished and the Total ACL is exceeded due to an overage in the recreational ACL. The amount of the overage would be deducted from the following year's recreational ACL.**

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

Snapper Grouper AP Comments and Recommendations

The AP recommended **Alternative 4** (payback of overage if total ACL is exceeded due to recreational landings) as preferred. The AP reasoned that **Preferred Alternative 4** would provide ample protection for the stock at this time, given the fluctuating numbers, but yet will not cause undue harm. That is, **Preferred Alternative 4** meets the intent of **Alternative 3** (in-season closure when the ACL is met or projected to be met) and provides a "safety net" with the payback provision.

Law Enforcement AP Comments and Recommendations

The LEAP received an update on actions and alternatives being considered at their February 2013 meeting. The LEAP had no concerns or recommendations for any of the actions contained in the amendment. The LEAP received the completed draft amendment via e-mail on August 27, 2013, with a request for comments. None were received.

SSC Comments and Recommendations

The SSC had the opportunity to review some of the analyses for Regulatory Amendment 14 in April 2013. The SSC made the following recommendation: *The SSC noted that not all the proposed changes provide socioeconomic benefits. It doesn't seem possible to get a good grasp on the actual socioeconomic benefits to the entire fishery when there are some people for and some opposed to these changes. Due to the schedule and amount of analyses required the SSC requests a final opportunity to review this amendment after analyses are completed. Specifically, the Committee suggests that the SEP be given the opportunity to review in more detail by e-mail.*

Additionally, the SSC recommends that socioeconomic issues of this nature be prioritized in the Council's research priority plan given the increased need for this type of information and the high degree

of uncertainty in socioeconomic analysis due to short timelines with regulatory amendment preparation as well as the relatively large number of changes in the management process.

South Atlantic Council's Choice for Preferred Alternative

Given that the vermilion snapper stock is no longer overfished, an AM that was not dependent on the stock being overfished was needed. Both the Snapper Grouper AP and public comments supported **Preferred Alternative 4** (payback only of the total ACL is exceeded due to recreational landings). The South Atlantic Council chose to deviate slightly from AMs imposed on other snapper grouper species by selecting **Alternative 4** as their preferred. Their choice was based on the currently optimal status of the stock, and the need to bring consistency to AMs applied to managed fisheries.

The South Atlantic Council concluded **Preferred Alternative 4** best addresses the need to ensure overfishing of vermilion snapper does not occur. **Preferred Alternative 4** 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 National Environmental Policy Act (NEPA), federal agencies are mandated to assess not only the indirect and direct impacts, but the cumulative impacts of proposed actions as well. NEPA defines 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". 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 3.1.3** 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. For the actions in Regulatory Amendment 14, data were inspected from 1998 (black sea bass) and included projections to 2016 (vermilion snapper). In general, the last 3-5 years (2008-2012) were used for data analysis.

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 the snapper grouper species addressed in this amendment

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.

Amendment 9 to the Snapper Grouper FMP (Amendment 9; SAFMC 1998) 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.

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.

Amendment 18A to the Snapper Grouper FMP (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 sector, 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.

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.

At their March 2012 meeting, the South Atlantic Council requested development of Regulatory Amendment 13 to the Snapper Grouper FMP (SAFMC 2013b) to allow for adjustment of allocations and ACLs based on the new landings information from the Marine Recreational Information Program. Regulatory Amendment 13 was approved by the South Atlantic Council at their December 2012 meeting. A proposed rule published in the *Federal Register* on March 21, 2013 (78 FR 17336), and the comment period ended on April 21, 2013. The final rule published in the *Federal Register* on June 17, 2013, and regulations became effective on July 17, 2013.

At their September 2012 meeting, the South Atlantic Council requested development of Regulatory Amendment 15 to the Snapper Grouper FMP (SAFMC 2013c) to adjust the yellowtail snapper ABC and ACL based on results from a recent assessment, and remove the provision to prohibit commercial harvest of all shallow water grouper species when the gag quota is met. The South Atlantic Council approved Regulatory Amendment 15 at their December 2012. Additionally, at the South Atlantic Council's request while they were developing Regulatory Amendment 15, NMFS implemented an emergency rule under the Magnuson-Stevens Act to increase the commercial sector's ACL based upon the new stock assessment (77 FR 66744, November 7, 2012). The proposed rule published on May 24, 2013, (78 FR 31511), and the comment period ended on June 24, 2013. The final rule published on August 13, 2013 (78 FR 49183) and regulations became effective on September 12, 2013.

The Joint Generic Dealer Reporting Amendment is under review by the Secretary of Commerce (Secretary) and would require that all dealers report landings information electronically on a weekly basis to improve the timeliness and accuracy of landings data. This amendment applies to FMPs for dolphin wahoo, snapper grouper, and coastal migratory pelagics.

Regulatory Amendment 18 to the Snapper Grouper FMP (SAFMC 2013e) adjusts ACLs for vermilion snapper and red porgy based on the results of recent stock assessment updates. Regulatory Amendment 18 was approved by the South Atlantic Council at their March 2013 meeting. The proposed rule published in the *Federal Register* on May 8, 2013 (77 FR 26740), and the comment period ended on June 7, 2013. The final rule published on August 6, 2013 (78 FR 47574) and regulations became effective on September 5, 2013.

Regulatory Amendment 19 to the Snapper Grouper FMP (SAFMC 2013f) adjusts ACLs for black sea bass based on the results of a recent stock assessment update. Regulatory Amendment 19 also prohibits the use of black sea bass pots during November through April of each year to prevent interactions with whales. Regulatory Amendment 19 was approved by the South Atlantic Council at a special May 2013 South Atlantic Council meeting. The Final Rule published in the *Federal Register* on September 23, 2013. The ACL increase became effective on September 23, 2013, while the annual black sea bass pot closure is effective on October 23, 2013.

The South Atlantic Headboat Reporting Amendment is under review by the Secretary and would require that all federally-permitted headboats on the South Atlantic report their landings information electronically, and on a weekly basis in order to improve the timeliness and accuracy of harvest data. The Proposed Rule published in the *Federal Register* on September 27, 2013.

At their September 2012 meeting, the South Atlantic Council directed staff to develop Amendment 27 to the Snapper Grouper FMP (under review) to address issues related to blue runner, and extension of management into the Gulf of Mexico for Nassau grouper. The Proposed Rule published in the *Federal Register* on September 27, 2013.

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

The Joint Commercial Logbook Reporting Amendment would require electronic reporting of landings information by federally-permitted commercial vessels, which would increase the timeliness and accuracy of landings data.

The Joint Charter Boat Reporting Amendment would require charter vessels to regularly report their landings information electronically. Including charter boats in the recreational harvest reporting system would further improve the agency's ability to monitor recreational catch rates in-season.

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 South Atlantic 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. In June 2013, the South Atlantic Council changed the focus of Amendment 22 to a recreational tag program to monitor harvest of species with small ACLs.

At their June 2013 meeting, the South Atlantic Council requested development of Regulatory Amendment 16 to the Snapper Grouper FMP to adjust management measures for black sea bass by removing the November through April prohibition on the use of black sea bass pots in Regulatory

Amendment 19 (SAFMC 2013f). An options paper was reviewed by the South Atlantic Council in September 2013. The South Atlantic Council will review a scoping document in December 2013.

At their September 2012 meeting, the South Atlantic Council requested development of Regulatory Amendment 17 to the Snapper Grouper FMP to consider marine protected areas to provide additional protection for speckled hind and warsaw grouper. This action was previously considered in Comprehensive Ecosystem-Based Amendment 3. The South Atlantic Council discussed the regulatory amendment in September 2013. The South Atlantic Council reviewed a range of alternatives to be taken out for public comment in December 2013, however, they deferred future consideration until the visioning process is complete.

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.

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 in the South Atlantic. Oil from the spill site has not been detected in the South Atlantic region, and did not likely 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 greater amberjack, black sea bass, vermilion snapper, and gag. Trends in the condition of these species are determined through the Southeast Data, Assessment and Review (SEDAR) process. More information on the SEDAR process and assessed species that are included in this amendment can be found in **Sections 3.2.1** and **3.2.3** whereas information on other affected species can be found in **Section 3.2.2** 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

In addition to the information in **Item Number 6** of this CEA, the reader is directed to **Section 3.2.1** of this document for more details regarding the species addressed in this amendment. Recent stock assessments for black sea bass (2013 update to SEDAR 25) indicates the stock is rebuilt. The vermilion snapper (SEDAR 17 Update 2012) indicates the species is no longer undergoing overfishing and is not overfished. ACLs for vermilion snapper and black sea bass have been increased through Regulatory Amendment 18 (vermilion snapper; SAFMC 2013e) and Regulatory Amendment 19 (black sea bass; SAFMC 2013f). Gag is undergoing overfishing, but is not overfished according to a 2006 assessment (SEDAR 10 2006). However, actions were taken through Amendment 16 to end overfishing. Furthermore, Amendment 17B (SAFMC 2010b) to the Snapper Grouper FMP implemented ACLs and AMs to ensure overfishing of gag does not occur. Greater amberjack (SEDAR 15 2008) is not overfished or undergoing overfishing.

Climate change

Global climate changes may or may not 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 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 a detailed discussion of the baseline conditions of the species addressed in this amendment that have undergone stock assessments (black sea bass, vermilion snapper, greater amberjack, and gag,), 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.

The cause and effect relationship of fishing and regulatory actions is shown in **Table 6.1.1**.

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 (Snapper Grouper Amendment 1; SAFMC 1988).	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 (Snapper Grouper Amendment 4; SAFMC 1991).	Reduce mortality of snapper grouper species.

Time period/dates	Cause	Observed and/or Expected Effects
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 Oculina Experimental Closed Area (OECA). Snapper Grouper Amendment 6; 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	Snapper Grouper Amendment 6; SAFMC 1993.	Commercial quota for golden tilefish; commercial trip limits for golden tilefish; include golden tilefish in grouper recreational aggregate bag limits.
February 24, 1999	Snapper Grouper Amendment 6; SAFMC 1993.	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 grouper, and golden, blueline and sand tilefish.
Effective October 23, 2006	Stock assessments indicate black sea bass vermilion snapper, red porgy, and snowy grouper are undergoing overfishing. Snapper grouper FMP Amendment 13C (SAFMC 2006)	Management measures implemented to end overfishing of these species.
Effective February 12, 2009	Recognized need to provide additional protection to deepwater snapper grouper species, and to protect spawning locations. Snapper grouper FMP 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	Stock assessments indicate snowy grouper, black sea bass, and red porgy are overfished. Snapper grouper FMP 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.	Concern that bag limit sales of snapper grouper species obfuscates accurate reporting of landings data. Snapper grouper FMP 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	Stock assessment indicates gag is	Protect spawning aggregations and

Time period/dates	Cause	Observed and/or Expected Effects
July 29, 2009	experiencing overfishing and is approaching an overfished condition. Snapper grouper FMP Amendment 16 (SAFMC 2009a).	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	Stock assessment indicated red snapper is overfished and undergoing overfishing. 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	Stock assessment indicated red snapper is overfished and undergoing overfishing. 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	Stock assessment indicated red snapper is overfished and undergoing overfishing. Snapper Grouper FMP Amendment 17A (SAFMC 2010a).	Specified SFA parameters for red snapper; ACLs and ACTs; management measures to limit recreational and commercial sectors to their ACTs; 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	Reauthorized Magnuson-Stevens Act requires ACLs for all species undergoing overfishing. Snapper Grouper 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	New red snapper assessment indicates stock is undergoing overfishing and is overfished but area closures approved in Amendment 17B are not needed. Regulatory Amendment 10 (SAFMC 2010c).	Removed of snapper grouper area closure approved in Amendment 17A.
Effective Date July 15, 2011	Additional management measures are considered to help ensure overfishing of black sea bass, vermilion snapper, and gag does not occur. Desired to have management measures slow the rate of capture to prevent derby fisheries. Regulatory Amendment 9 (SAFMC 2011a)	Harvest management measures for black sea bass; commercial trip limits for gag, vermilion snapper, and greater amberjack

Time period/dates	Cause	Observed and/or Expected Effects
Effective Date May 10, 2012	New analysis demonstrates prohibition to harvest of 6 deepwater species in Amendment 17B is not an effective measure to reduce bycatch of speckled hind and warsaw grouper. Regulatory Amendment 11 (SAFMC 2011b)	Removed the harvest prohibition of six deepwater snapper grouper species implemented in Amendment 17B.
Effective Date April 16, 2012	Reauthorized Magnuson-Stevens Act requires ACLs for species not undergoing overfishing. 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	Stock assessment indicates red grouper is overfished and undergoing overfishing. 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	Need to slow rate of harvest in black sea bass pot sector to ease derby conditions. 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)	As red snapper stock rebuilds some limited harvest of red snapper can occur, as long as rebuilding is not compromised. Temporary Rule through Emergency Action (Red snapper).	Established limited red snapper fishing seasons (commercial and recreational) in 2012.
Target 2012	Clarification of action in Amendment 18A for black sea bass pot endorsement transferability was needed. 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	Some wreckfish catch shares have become available over time. Amendment 20A (Wreckfish) (SAFMC 2012b).	Redistributed inactive wreckfish shares.
Effective Date October 9, 2012	Stock assessment indicates golden tilefish overfishing has been ended and catch levels can be increased. 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.
Effective Date May 23, 2013	There is a need to reduce effort in the commercial longline sector that targets golden tilefish to ease derby conditions. Snapper Grouper Amendment 18B (SAFMC 2013a)	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.

Time period/dates	Cause	Observed and/or Expected Effects
July 17, 2013	The recreational data collection system has changed from MRFSS to MRIP. ACLs and allocations in place utilize MRFSS data. Regulatory Amendment 13. (SAFMC 2013b).	Adjust ACLs and allocations for unassessed snapper grouper species with MRIP recreational estimates
August 23, 2013	As the red snapper stock rebuilds, some allowable harvest could occur if rebuilding is not affected. Snapper Grouper Amendment 28 (SAFMC 2013d).	Modify red snapper management measures including the establishment of a process to determine future annual catch limits and fishing seasons.
September 12, 2013	New stock assessments completed for vermilion snapper and red porgy. Regulatory Amendment 18 (SAFMC 2013e).	Adjust ACLs and management measure for vermilion snapper and red porgy based on results from new update assessment.
September 23, 2013	New stock assessment for black sea bass indicates the stock is rebuilt and catch levels can be increased. Regulatory Amendment 19 (SAFMC 2013f).	Increase recreational and commercial ACLs for black sea bass. Black sea bass pots prohibited from November 1 through April 30 (effective October 23, 2013).
September 5, 2013	New stock assessment indicates catch levels of yellowtail snapper can be increased. Accountability measures for gag can be adjusted because effective means are in place to ensure overfishing does not occur. Regulatory Amendment 15 (SAFMC 2013c).	Increase yellowtail snapper ACL, remove accountability measure for gag that closes commercial harvest for all shallow water grouper species when the gag ACL is met. Reduce gag ACL to account for dead discards when fishermen target co-occurring shallow water grouper species.
Target 2013	Blue runner are caught primarily in state waters of FL, and it is not clear if federal management is needed. Nassau grouper is no longer managed by Gulf Council. South Atlantic Council would like to be able to make adjustment to ACLs more quickly after a stock assessment has been completed. Snapper Grouper Amendment 27 (under review).	Establish the South Atlantic Council 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	Southeast Fisheries Science Center has established a program that allows headboats to report landings through electronic means. Generic For-Hire Reporting Amendment (Approved by South Atlantic Council).	Require all federally-permitted headboats in the South Atlantic to report landings information electronically and on a weekly basis.
Target 2014	There is a need to control recreational harvest of snapper grouper species with very small ACLs. Snapper Grouper Amendment 22 (under development).	Develop a recreational tag program for snapper grouper species in the South Atlantic.
Target 2014	South Atlantic Council's SSC has identified new methods to estimate ABC for data poor species. Snapper Grouper Amendment 29 (under development).	Update ABCs, ACLs, and ACTs for snapper grouper species based on recommendations from SSC.

Time period/dates	Cause	Observed and/or Expected Effects
Target 2014	Joint Commercial Logbook Reporting Amendment	Require all federally-permitted commercial fin fish fishermen in the southeast to report electronically.
Target 2014/2015	Joint Charterboat Reporting Amendment	Require all federally-permitted charterboats to report landings information electronically.

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 as necessary. As shown in **Table 6.1.1** above, a number of amendments could be implemented in the near future. For instance, Amendment 22 would establish a recreational tag program for snapper grouper species with very low ACLs.

None of the impacts from the proposed management actions (as summarized in **Chapter 2** of this document) have been determined to be significant. See **Chapter 4** for the detailed discussions of the magnitude of the impacts of the preferred alternatives on the human environment.

None of the actions in Regulatory Amendment 14 would have significant biological, social, or economic effects because even though the actions extend fishing opportunities, accountability measures are also considered, and are in place to ensure overfishing does not occur. Therefore, the cumulative effects of the actions proposed in Regulatory Amendment 14 are not expected to affect the bycatch, diversity, and ecosystem structure of fish communities, or safety at sea of fishermen targeting snapper grouper, and other species managed by the South Atlantic Council. Based on the cumulative effects analysis presented herein, the proposed actions will not have any significant cumulative impacts compared to other past, present, and foreseeable future actions.

The actions in Regulatory Amendment 14 are not likely to result in direct, indirect, or cumulative effects to unique areas, such as significant scientific cultural, or historical resources, park land, prime farmlands, wetlands, wild and scenic rivers or ecologically critical areas as the proposed action is not expected to substantially increase fishing effort or the spatial and/or temporal distribution of current fishing effort within the South Atlantic region. The USS Monitor, Gray's Reef, and Florida Keys National Marine Sanctuaries are within the boundaries of the South Atlantic exclusive economic zone (EEZ). The proposed actions are not likely to cause loss or destruction of these national marine sanctuaries.

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

Participation in and the economic performance of the fisheries addressed in this document have been affected by a combination of regulatory, biological, social, and external economic factors. Regulatory measures have obviously affected the quantity and composition of harvests of species addressed in this document, through the various size limits, seasonal restrictions, trip or bag limits, and quotas. For the snapper grouper fishery, gear restrictions, notably fish trap and longline restrictions, have also affected harvests and economic performance. The limited access program implemented in 1998/1999 substantially affected the number of participants in the snapper grouper fishery. Entry into the snapper grouper commercial fishery requires access to additional capital and two available permits to purchase (due to the passive reduction that requires two permits eliminated for each new permit), which may limit opportunities for new entrants. Additionally, almost all fishermen or businesses with a snapper grouper commercial or for-hire permit also hold at least one (and usually multiple) additional commercial or for-hire permit to maintain the opportunity to participate in other fisheries. Commercial fishermen, for-hire vessel owners and crew, and private recreational anglers commonly participate in multiple fisheries throughout the year. Even within the snapper grouper fishery, effort can shift from one species to another due to environmental, economic, or regulatory changes. Overall, changes in management of one species in the snapper grouper fishery can impact effort and harvest of another species (in the snapper grouper fishery or in another fishery) because of multi-fishery participation that is characteristic in the South Atlantic region.

Biological forces that either motivate certain regulations or simply influence the natural variability in fish stocks have likely played a role in determining the changing composition of the fisheries addressed by this document. Additional factors, such as changing career or lifestyle preferences, stagnant to declining prices due to imports, increased operating costs (gas, ice, insurance, dockage fees, etc.), and increased waterfront/coastal value leading to development pressure for other than fishery uses have impacted both the commercial and recreational fishing sectors. In general, the regulatory environment for all fisheries has become progressively more complex and burdensome, increasing the pressure on economic losses, business failure, occupational changes, and associated adverse pressures on associated families, communities, and businesses. Some reverse of this trend is possible and expected through management. However, certain pressures would remain, such as total effort and total harvest considerations, increasing input costs, import induced price pressure, and competition for coastal access.

A description of the human environment, including a description of the snapper grouper fishery, as well as associated key fishing communities is contained in **Section 3.3** and a description of the history of management of the fisheries addressed in this document is contained in **Appendix D**. A detailed description of the expected social and economic impacts of the actions in this document is contained elsewhere in **Chapter 4**.

The proposed actions in this amendment are part of the larger management program for snapper grouper, with primary management working through annual catch limits (ACLs) and accountability measures (AMs). The actions in the Comprehensive ACL Amendment (SAFMC 2011c) established ACLs and AMs for species that are not experiencing overfishing. Actions in the Comprehensive ACL Amendment, however, are expected to have different effects in different areas. At any rate, the actions contained in this document are expected to prevent overfishing from occurring and to support the achievement of OY in the respective fisheries over time, resulting in social and economic gains. In addition to the species included in the Comprehensive ACL Amendment, the ACLs, AMs and management measures have been developed in Snapper Grouper Amendments 17A and 17B (SAFMC 2010a, 2010b).

Additional actions have been implemented or are in the process of being implemented for snapper grouper species that, in combination with the proposed actions in this amendment, could contribute to the cumulative impact on the for-hire captain and crew, customers, and associated businesses and communities, including Regulatory Amendment 9 (lower bag limit for black sea bass; SAFMC 2011a); Amendment 18A (commercial black sea bass measures; SAFMC 2012a); Regulatory Amendment 15 (measures for yellowtail snapper and gag; SAFMC 2013c); Regulatory Amendment 18 (revised ACLs for vermilion snapper and red porgy; SAFMC 2013e); and Regulatory Amendment 19 (revised black sea bass ACL; SAFMC 2013f). Additionally, several potential new snapper grouper amendments are being considered that will have some effects on participants in the fishery and associated communities and businesses, including Regulatory Amendment 17 (MPAs to protect warsaw grouper and speckled hind). Other amendments are under development but those listed above are expected to have some impact on the commercial and for-hire fleet of the snapper grouper fishery in addition to private recreational anglers. It should also be noted that some actions, such as removal of the shallow water grouper closure when the gag commercial ACL is met in Regulatory Amendment 15 or the increase in the black sea bass ACL in Regulatory Amendment 19, are expected to reduce some negative social and economic impacts on the fishery due to regulations and restricted access to the resource.

The snapper grouper fishery also exists within the context of management and conservation of protected species (**described in Section 3.2.4**). Authority and requirements under the Endangered Species Act and the Marine Mammal Protection Act requires that negative impacts on protected species due to fishing activities be minimized to the extent possible. Current and future management measures and regulations contribute to maintenance and recovery of federally protected species, which has broad positive social effects. However, some measures can negatively impact fishermen, fishing businesses, and communities if requirements resulting from a formal consultation restrict access to the resource or increase business costs. Specifically for the black sea bass commercial pot component of the snapper grouper fishery, which has specific regulations and requirements in place to minimize potential interaction with right whales, current and future regulatory changes could have significant impact on the black sea bass pot businesses.

The cumulative social and economic effects of past, present, and future amendments may be described as limiting fishing opportunities in the short-term, with some exceptions of actions that alleviate some negative social and economic impacts. The intent of these amendments is to improve prospects for sustained participation in the respective fisheries over time and the proposed actions in this amendment are expected to result in some important long-term benefits to the commercial and for-hire fishing fleets,

fishing communities and associated businesses, and private recreational anglers. The proposed changes in management of greater amberjack, vermilion snapper, black sea bass, and gag may contribute to changes in the snapper grouper fishery within the context of the current economic and regulatory environment at the local and regional level.

Chapter 7. List of Preparers

Table 7.1.1. List of preparers of the document.

Name	SAFMC	Title
Myra Brouwer	SAFMC	IPT Lead/Fishery Scientist
Brian Cheuvront	SAFMC	Economist
Mike Errigo	SAFMC	Fishery Biologist
Nick Farmer	NMFS/SF	Data Analyst
Andrew Herndon	NMFS/PR	Fishery Biologist
Michael Jepson	NMFS/SF	Social Scientist
Tony Lamberte	NMFS/SF	Economist
Michael Larkin	NMFS/SF	Data Analyst
Kari MacLauchlin	SAFMC	Social Scientist
Jack McGovern	NMFS/SF	Fishery Biologist
Nikhil Mehta	NMFS/SF	IPT Lead/Fishery Biologist
Larry Perruso	NMFS/SEFSC	Economist
Scott Sandorf	NMFS/SF	Technical Writer Editor
Monica Smit-Brunello	NOAA/GC	Attorney
Jessica Stephen	NMFS/SF	Data Analyst
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, SEFSC=Southeast Fisheries Science Center

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
David Dale	NMFS/HC	EFH Specialist
Rick DeVictor	NMFS/SF	IPT Lead/Fishery Biologist
Mike Errigo	SAFMC	Fishery Biologist
Nick Farmer	NMFS/SF	Data Analyst
Andrew Herndon	NMFS/PR	Fishery Biologist
Michael Jepson	NMFS/SF	Social Scientist
Todd Kellison	NMFS/SEFSC	Fishery Biologist
David Keys	NMFS/SER	Regional NEPA Coordinator
Tony Lamberte	NMFS/SF	Economist
Michael Larkin	NMFS/SF	Data Analyst
Jennifer Lee	NMFS/PR	Fishery Biologist
Kari MacLauchlin	SAFMC	Social Scientist
Anna Martin	SAFMC	Fishery Scientist
Jack McGovern	NMFS/SF	Fishery Biologist
Larry Perruso	NMFS/SEFSC	Economist
Roger Pugliese	SAFMC	Fishery Biologist
Jeff Radonski	NMFS/OLE	Special Agent
Scott Sandorf	NMFS/SF	Technical Writer Editor
Monica Smit-Brunello	NOAA/GC	Attorney
Jessica Stephen	NMFS/SF	Data Analyst
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, EFH = Essential Fish Habitat, GC = General Counsel, Eco=Economics, NEPA = National Environmental Policy Act, SEFSC=Southeast Fisheries Science Center, OLE = Office of Law Enforcement

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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