Regulatory Amendment 9
to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region and Environmental Assessment

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ABBREVIATIONS AND ACRONYMS

ABC	Acceptable biological catch
ACCSP	Atlantic Coastal Cooperative Statistics Program
ACL	Annual Catch Limits
AM	Accountability Measure
ACT	Annual Catch Target
APA	Administrative Procedures Act
ASMFC	Atlantic States Marine Fisheries Commission
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
CEA	Cumulative Effects Analysis
CEQ	Council on Environmental Quality
CFMC	Caribbean Fishery Management Council
CPUE	Catch per unit effort
CRP	Cooperative Research Program
CZMA	Coastal Zone Management Act
DEIS	Draft Environmental Impact Statement
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EFH-HAPC	Essential Fish Habitat - Habitat Area of Particular Concern
EIS	Environmental Impact Statement
ESA	Endangered Species Act of 1973
F	A measure of the instantaneous rate of fishing mortality
$F_{30\%SPR}$	Fishing mortality that will produce a static SPR = 30%.
$F_{45\%SPR}$	Fishing mortality that will produce a static SPR = 45%.
F_{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
FONSI	Finding of No Significant Impact
GFMC	Gulf of Mexico Fishery Management Council
IFQ	Individual fishing quota
M	Natural mortality rate
MARFIN	Marine Fisheries Initiative
MARMAP	Marine Resources Monitoring Assessment and Prediction Program

MBTA	Migratory Bird Treaty Act
MFMT	Maximum Fishing Mortality Threshold
MMPA	Marine Mammal Protection Act of 1972
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 of 1969
NMFS	National Marine Fisheries Service
NMSA	National Marine Sanctuary Act
NOAA	National Oceanic and Atmospheric Administration
OFL	Overfishing Limit
OY	Optimum Yield
PQBM	Post Quota Bycatch Mortality
PSE	Percent Standard Error
R	Recruitment
RFA	Regulatory Flexibility Act
RIR	Regulatory Impact Review
SAFE Report	Stock Assessment and Fishery Evaluation Report
SAMFC	South Atlantic Fishery Management Council
SDDP	Supplementary Discard Data Program
SEDAR	Southeast Data Assessment and Review
SEFSC	Southeast Fisheries Science Center
SERO	Southeast Regional Office
SFA	Sustainable Fisheries Act
SIA	Social Impact Assessment
SPR	Spawning Potential Ratio
SSC	Scientific and Statistical Committee
TAC	Total allowable catch
TL	Total length
T_{MIN}	The length of time in which a stock could rebuild to B_{MSY} in the absence of fishing mortality
USCG	U.S. Coast Guard

REGULATORY AMENDMENT 9 TO THE FISHERY MANAGEMENT PLAN FOR THE SNAPPER GROUPER FISHERY OF THE SOUTH ATLANTIC REGION INCLUDING AN ENVIRONMENTAL ASSESSMENT, INITIAL REGULATORY FLEXIBILITY ACT ANALYSIS, REGULATORY IMPACT REVIEW, AND SOCIAL IMPACT ASSESSMENT

Proposed actions:	Establish trip limits/split season quotas/spawning season closures for black sea bass, reduce black sea bass bag limit, establish trip limit for vermilion snapper and gag, and modify the trip limit for greater amberjack under the current Framework Procedure.
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ABSTRACT

Amendments 13C, 16, and 17B to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region implemented harvest reductions, recreational and commercial allocations, recreational and commercial annual catch limits (ACLs), and accountability measures (AMs) for black sea bass, gag, and vermilion snapper, which are undergoing overfishing. ACLs and AMs for greater amberjack are being established in the Comprehensive ACL Amendment for the South Atlantic Region. The current catch limits, in combination with management measures designed to manage these stocks, have the potential to encourage derby-style fisheries. Furthermore, as overfishing is ended for black sea bass, which is overfished, and biomass increases, its respective ACLs are likely to be met earlier each fishing season. Additionally, the quota for greater amberjack has never been met, and therefore, optimum yield for the species is not being achieved.

An increasingly restrictive regulatory environment compounds these problems in the form of effort shifts from other more restricted fisheries into the fisheries for black sea bass, gag, greater amberjack, and vermilion snapper. In order to prevent the progressive shortening of fishing seasons for black sea bass, gag, and vermillion snapper, and to maximize the probability of achieving optimum yield for greater amberjack, Regulatory Amendment 9 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Regulatory Amendment 9) is being developed. Regulatory Amendment 9 would establish trip limits for vermilion snapper, and gag; reduce the black sea bass bag limit; establish a split season quota for black sea bass; and modify the current trip limit for greater amberjack. Regulatory Amendment 9 also includes alternatives for trip limits, a change in the fishing year, and a spawning season closure for the black sea bass component of the snapper grouper fishery.

The current Framework allows for adjustments to be made to harvest parameters such as quotas, trip limits, bag limits, size limits, and seasonal or area closures via regulatory amendment. Regulatory amendments require less time to implement than a standard fishery management plan amendment, and are effective until modified unlike temporary or emergency rules.

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SUMMARY

Amendments 13C, 16, and 17B to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP) put in place harvest reductions, recreational and commercial allocations, recreational and commercial annual catch limits (ACLs), and accountability measures (AMs) for black sea bass, gag, and vermilion snapper, which are undergoing overfishing. ACLs and AMs for greater amberjack, which is not overfished or undergoing overfishing, are being established in the Comprehensive ACL Amendment for the South Atlantic region. The current catch limits, in combination with management measures designed to manage these stocks, have encouraged derby-style fisheries for black sea bass, gag, and vermilion snapper to develop. Additionally, the greater amberjack quota has never been met, and the current trip limit may prevent optimum yield from being achieved for the species. In order to prevent the progressive shortening of fishing seasons for black sea bass, gag, and vermilion snapper, and to maximize the probability of reaching optimum yield for greater amberjack, Regulatory Amendment 9 is being developed. Regulatory Amendment 9 includes alternatives that would establish or modify trip limits for black sea bass, gag, greater amberjack, and vermilion snapper. Regulatory Amendment 9 also includes alternatives for split season quotas, a bag limit modification, and a spawning season closure for the black sea bass component of the snapper grouper fishery.

Purpose and Need of the Proposed Actions

The ***purpose*** of this amendment is to prevent the progressive shortening of fishing seasons for black sea bass, vermilion snapper, and gag, and maximize the probability of reaching optimum yield for greater amberjack. This would be accomplished through: the establishment of trip limits for black sea bass, vermilion snapper, and gag; split season quotas, a spawning season closure for black sea bass; a reduction in the black sea bass bag limit, and modifying the current trip limit for greater amberjack under the current Framework Procedure for Setting Total Allowable Catch for Snapper Grouper (Framework).

The ***need*** for this action is to comply with the Magnuson-Stevens Act's national standards, to ensure equity in harvest opportunities, and promote safety at sea through the prevention of derby-style fisheries, while minimizing adverse socioeconomic impacts.

Each *action* has a range of *alternatives* in order to accomplish the purpose and need. Alternatives are developed for Council members and the public to evaluate biological, economic, and social impacts. The public is provided the opportunity to comment on the alternatives. The range of alternatives must include at least the no action (to do nothing) and preferred (the Council's choice) alternatives.

Management Actions

Regulatory Amendment 9 contains 4 actions:

Action 1: Harvest management measures for black sea bass (including a trip limit, split season quotas, carry-over of unused ACL, gear restrictions, bag limit modification, and a spawning season closure).

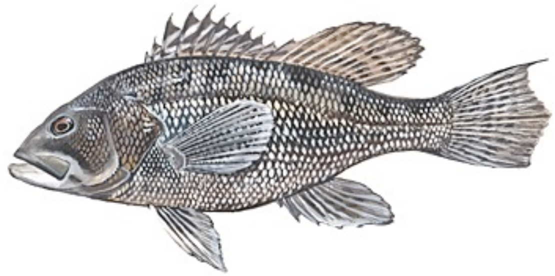
Action 2: Trip limits for vermilion snapper.

Action 3: Trip limits for gag.

Action 4: Trip limits for greater amberjack.

Background

Black Sea Bass



Black sea bass is overfished and undergoing overfishing; it is being managed under a rebuilding plan. Management measures to rebuild the stock are currently in place, including a commercial quota and recreational allocation, now referred to as annual catch limits (ACLs). Seven other snapper grouper species are also undergoing overfishing. Harvest restrictions placed on those, and other co-occurring species such as vermilion snapper and gag, have led to some effort shifts to fisheries such as black sea bass. Because black sea bass and vermilion snapper are managed with commercial quotas, which have been reduced in recent years to end overfishing, effort shifts to those fisheries in addition to increased biomass levels, have resulted in their respective quotas being met earlier each year. The June-May fishing year for black sea bass closed on December 20, 2009, and October 6, 2010 (but reopened for two weeks in December 2010).

Amendment 13C (SAFMC 2006) to the Snapper Grouper FMP put in place management measures to reduce harvest of black sea bass by 35%. A total of 633,000 pounds gutted weight (746,000 pounds whole weight) in year 1; 560,000 pounds gutted weight (661,000 pounds whole weight) in year 2; and 409,000 pounds gutted weight (483,000 pounds whole weight) in year 3 onwards until modified was allocated to the commercial sector as the annual quota. After the quota is met all pots are required to be removed from the water.

The fishing season was also changed from the calendar year to June 1 through May 31. Additionally, the bag limit was reduced from 20 to 15 black sea bass per person per day and the minimum size limit for the recreational sector was increased to 12 inches total length. The amendment also specified a recreational allocation of 633,000 pounds gutted weight (746,000 pounds whole weight) in year 1; 560,000 pounds gutted weight (661,000 pounds whole weight) in year 2; and 409,000 pounds gutted weight (483,000 pounds whole weight) in year 3 onwards until modified.

Vermilion Snapper

Overfishing of vermilion snapper during 1999-2001 was addressed in Amendment 13C (SAFMC 2006). At that time it was unclear if vermilion snapper were overfished and/or experiencing overfishing based upon a poorly defined stock-recruitment relationship. Therefore, the Council and the Council's Scientific and Statistical Committee (SSC) felt it was best to account for this uncertainty by capping commercial landings at 1,100,000 pounds, which was slightly lower than the commercial portion of optimum yield (1,114,310 pounds gutted weight), until the 2007 stock assessment was completed.

A new aged-based assessment for vermilion snapper completed in 2008 verified vermilion snapper is experiencing overfishing but indicated the overfished status of the stock is unknown. Based on the results of the new assessment, Amendment 16 (SAFMC 2009a) reduced commercial harvest of vermilion snapper by 29%, and implemented a split season quota of 315,523 pounds gutted weight during January through June and 302,523 pounds gutted weight from July through December.

Additionally, recreational harvest of vermilion snapper is prohibited from November through March each year. As overfishing ends there could be more fish available for harvest, increasing the chance that the quotas could be met sooner each year, which could contribute to a derby fishery. In 2010, the January through June quota was met on March 19, 2010 and the July through December on October 7, 2010. The quota closure could be expected even earlier in 2011 if no trip limits are implemented to prevent such an event.

Gag

Gag is experiencing overfishing but is not overfished. Amendment 16 (SAFMC 2009a) put in place a commercial quota for gag (352,940 pounds gutted weight), which was intended to cause an initial 35% reduction in commercial harvest. In addition to establishing a quota for gag, Amendment 16 also prohibited all harvest of shallow water grouper when the gag quota is met. Amendment 17B (SAFMC 2010b), established an aggregate commercial ACL for gag, red grouper, and black grouper of 662,403 pounds gutted weight, which is equivalent to the expected catch resulting from the implementation of management measures for red grouper and black grouper in Amendment 16 and the gag ACL specified in Amendment 16.

Amendment 17B prohibited commercial possession of shallow water groupers when either the gag or the gag-black grouper-red grouper ACL is projected to be met. The quota combined with increasing biomass, could lead to the quota being met more quickly overtime, encouraging a derby-style fishery to emerge.

Greater Amberjack

Greater amberjack is not overfished and is not experiencing overfishing. Amendment 9 (SAFMC 1998a) established measures for greater amberjack that: reduced the recreational bag limit from 3 to 1 fish per person per day; maintained the prohibition on harvest and possession in excess of the bag limit during April; established a quota at 63% of 1995 landings (quota=1,169,931 pounds gutted weight); began the fishing year on May 1; prohibited sale of fish harvested under the bag limit when the season is closed; and prohibited coring. Currently, there is a 1,000-pounds gutted weight trip limit, which is effective each year until the quota is reached. Since the trip limit was implemented, the commercial quota for greater amberjack has never been reached. With increased restrictions on other snapper grouper species through Amendments 13C and 16, there has been an interest in increasing the trip limit for greater amberjack.

Action 1. Harvest Management Measures for Black Sea Bass

Alternative 1 (No Action). Do not implement harvest management measures to reduce the rate at which the quota for black sea bass is being met.

Trip Limit Alternatives

Alternative 2. Establish a commercial trip limit for the black sea bass fishery (all gear).

- **Sub-Alternative 2a.** Establish a 500 pounds gw (590 pounds ww) trip limit.
- **Sub-Alternative 2b.** Establish a 750 pounds gw (885 pounds ww) trip limit.
- **Sub-Alternative 2c.** Establish a 1,000 pounds gw (1,180 pounds ww) trip limit.
- **Sub-Alternative 2d.** Establish a 1,250 pounds gw (1,475 pounds ww) trip limit.
- **Sub-Alternative 2e.** Establish a 1,000 pounds gw (1,180 pounds ww) trip limit; reduce to 500 pounds gutted weight (590 pounds ww) when 75% of the ACL (quota) is met.
- **Sub-Alternative 2f.** Establish a 2,000 pounds gw (2,360 pounds ww) trip limit.
- **Sub-Alternative 2g.** Establish a 2,500 pounds gw (2,950 pounds ww) trip limit.
- **Sub-Alternative 2h.** Establish a 340 pounds gw trip limit.

Fishing Year Alternatives

Alternative 3 (Preferred). Retain the June-May fishing year. Specify separate commercial ACLs (quotas) for June-November and December-May based on landings from 2006-2009.

Alternative 4. Retain the June-May fishing year. Specify commercial ACLs (quotas) for June-December and January-May based on landings from 2006-2009.

Alternative 5. Change the black sea bass fishing year to November-October. Specify separate commercial ACLs (quotas) for November-April 30 and May 1-October based on landings from 2006-2009.

Alternative 6. Change the black sea bass fishing year to January-December. Separate commercial ACLs (quotas) for January-June and July-December based on landings from 2006-2009.

ACL Carry-Over Alternatives & Gear Restrictions

Alternative 7 (Preferred). Under Alternatives 3-6, carry over unused portion of commercial ACL (quota) from first part of fishing year to second portion of season.

Alternative 8. Under Alternatives 3-6, carry over unused portion of commercial ACL (quota) from second part of fishing year to next fishing year.

Alternative 9. Under Alternatives 3-6, close fishing for black sea bass with pots when all but 100,000 pounds of the commercial ACL (quota) is harvested. Fishing with other allowable gear types would occur for the remainder of the sub-season. Start second season for the remainder of the quota for all allowable gear types.

Alternative 10. Under Alternatives 3-6, close fishing for black sea bass with pots when all but 50,000 pounds of the commercial ACL (quota) is harvested. Fishing with other allowable gear types would occur for the remainder of the sub-season. Start second season for the remainder of the quota for all allowable gear types.

Alternative 11. Close the pot fishery when 90% of the commercial ACL (quota) is met.

Spawning Season Closure Alternatives

Alternative 12. Establish a spawning season closure for black sea bass.

- **Sub-Alternative 12a.** Implement a March 1-April 30th spawning season closure for black sea bass, would apply to commercial and recreational sectors.
- **Sub-Alternative 12b.** Implement an April 1st-May 31st spawning season closure for black sea bass, would apply to commercial and recreational sectors.
- **Sub-Alternative 12c.** Implement a March 1st- May 31st spawning season closure for black sea bass, would apply to commercial and recreational sectors.
- **Sub-Alternative 12d.** Implement a May 1st- May 31st spawning season closure for black sea bass, would apply to commercial and recreational sectors.

Bag Limit Alternatives

Alternative 13. Modify the recreational bag limit for black sea bass

- **Sub-Alternative 13a.** Reduce the recreational bag limit from 15 to 7 black sea bass per person per day.
- **Sub-Alternative 13b (Preferred).** Reduce the recreational bag limit from 15 to 5 black sea bass per person per day.
- **Sub-Alternative 13c.** Reduce the recreational bag limit from 15 to 3 black sea bass per person per day.
- **Sub-Alternative 13d.** Reduce the recreational bag limit from 15 to 2 black sea bass per person per day.
- **Sub-Alternative 13e.** Reduce the recreational bag limit from 15 to 1 black sea bass per person per day.

Impacts from Action 1: Harvest Management Measures for Black Sea Bass

Impacts of Trip Limit Alternatives

Biological Impacts

Sub-Alternative 2a would keep the fishery open through February 2010 and almost two months longer than **Alternative 1 (No Action)** based on estimated data for the June 2009-May 2010 fishing year.

Sub-Alternatives 2b-2d would result in January closures and **Sub-Alternative 2e** would have a similar effect as **Sub-Alternative 2a**. The projected date of black sea bass commercial closure under various trip limits is shown in **Table S-1**.

Table S-1. Projected date of black sea bass commercial closure under various trip limits based on 2009-2010 fishing year. Shaded area represents date the 309,000 pounds gutted weight quota was actually met. Values in parentheses represent expected landings at end of fishing year if quota not met.

Fishing Year	**Alt 1**	**Alt 2a** (500 pounds)	**Alt 2b** (750 pounds)	**Alt 2c** (1,000 pounds)	**Alt 2d** (1,250 pounds)	**Alt 2e** (1,000 pounds reduce to 500 pounds when 75% quota met)
June 2006-May 2007	12-Feb	29-May	16-Mar	28-Feb	25-Feb	15-Mar
June 2007-May 2008	23-May	Not met (226,947)	Not met (273,051)	Not met (295,228)	Not met (307,587)	Not met (280,303)
June 2008-May 2009	25-Feb	Not met (249,126)	Not met (305,768)	23-Mar	7-Mar	30-Apr
June 2009-May 2010	20-Dec	9-Feb	19-Jan	6-Jan	5-Jan	28-Jan

Sub-Alternative 2f would result in closure dates almost identical to **Alternative 1 (No Action)** and would have little effect on extending the black sea bass fishery.

Sub-Alternative 2g would provide little effect on extending the fishing season for black sea bass. **Sub-Alternative 2h** would specify a trip limit that would allow the black sea bass fishery to remain open throughout the June-May fishing year. In the absence of a closure, it is estimated that the increased effort would have resulted in landings of 660,126 pounds gutted weight during the June 2009 to May 2010 fishing year. An approximate trip limit of 340 pounds gutted weight would be needed to keep the 2009 fishing year open.

The Council considered separate trip limits for the trap and hook-and-line fisheries at their September 2010 meeting. However, because black sea bass are predominately taken with traps, the Council determined that establishing trip limits for the hook-and-line component of the fishery would have little impact on extending the trap fishery.

Socioeconomic Impacts

In general, the smaller the trip limit the larger the economic losses if the trip-limited species is the only species being targeted (see **Table S-2**). However, smaller trip limits could have some economic benefit in that fish houses and dealers would possibly be able to maintain some supply for a longer period of the season and could possibly receive higher prices for their product since the market would not be flooded with an excess of black sea bass over a short period of time.

Table S-2. Dockside revenues foregone as a result of Alternatives 2a-2h based on 2007-2009 average landings data. Dollar values are in 2009 dollars. Pounds are in gutted weight.

Sub-Alternative	Total revenue loss (ex-vessel revenue)
2a: 500 pounds	$351,000
2b: 750 pounds	$198,000
2c: 1,000 pounds	$112,000
2d: 1,250 pounds	$60,000
2e: 1000 pounds reduced to 500 pounds when 75% of quota met	$181,000
2f: 2,000 pounds	$7,000
2g: 2,500 pounds	$1,000
2h: 340 pounds	$499,000

Sub-Alternatives 2a-2h would impact different gear groups differently. **Table S-3** shows the dockside revenues foregone as a result of **Sub-Alternatives 2a-2h** for pot and hook and line gear users. Similar to the economic effects for all gear users combined, as the trip limit increases dockside revenue losses decrease.

Table S-3. Dockside revenues foregone as a result of Alternatives 2a-2h based on 2007-2009 average landings data by gear for black sea bass. Dollar values are in 2009 dollars. Pounds are in gutted weight.

Sub-Alternative	Pot Gear - Total revenue loss (ex-vessel revenue)	Hook and Line - Total revenue loss (ex-vessel revenue)
2a: 500 pounds	$343,000	$8,000
2b: 750 pounds	$194,000	$4,000
2c: 1,000 pounds	$110,000	$2,000
2d: 1,250 pounds	$60,000	$1,000
2e: 1,000 pounds reduced to 500 pounds when 75% of quota met	$110,000	$6,000
2f: 2,000 pounds	$7,000	$0
2g: 2,500 pounds	$1,000	$0
2h: 340 pounds	$486,000	$13,000

Revenue losses will also differ by state. Revenue losses will be experienced primarily in North Carolina and South Carolina with some impacts in Georgia and Northeast Florida (see **Table S-4**).

Table S-4. Dockside revenues foregone as a result of Alternatives 2a-2h based on 2007-2009 average landings data, by state for black sea bass. Dollar values are in 2009 dollars. Pounds are gutted weight.

Sub-Alternative	North Carolina	South Carolina	Georgia and Northeast Florida	Southeast Florida	Florida Keys
2a: 500 pounds	$227,000	$114,000	$10,000	$0	$0
2b: 750 pounds	$132,000	$61,000	$6,000	$0	$0
2c: 1,000 pounds	$78,000	$31,000	$3,000	$0	$0
2d: 1,250 pounds	$45,000	$13,000	$2,000	$0	$0
2e: 1,000 pounds reduced to 500 pounds when 75% of quota met	$115,000	$52,000	$5,000	$0	$0
2f: 2,000 pounds	$7,000	$0	$1,000	$0	$0
2g: 2,500 pounds	$1,000	$0	$0	$0	$0
2h: 340 pounds	$323,000	$164,000	$13,000	$0	$0

Impacts of Fishing Year Alternatives

Biological Impacts

Alternatives 3 (Preferred)-6 would modify the fishing year and establish a split season commercial ACL (quota) for black sea bass based on historical proportions of landings.

> Splitting the harvest season into two components would allow black sea bass fishermen to capitalize on the resources over a longer period of time, rather than in one compressed season. Establishing two commercial fishing seasons would ensure the fishery has two distinct opportunities for harvest.

Alternatives 3 (Preferred)-6 would not set a trip limit so there would not be a problem with fishermen unexpectedly exceeding the trip limit and having to release black sea bass from pots, which could result in some discard mortality.

Given the current level of fishing pressure, the quotas would be expected to be met early during each fishing season for the four alternatives. This would result in periods of time of no fishing for black sea bass with pots, which would have a positive biological effects for black sea bass, which is overfished and in a rebuilding plan as well as protected species that have the potential of becoming entangled in pot lines. Furthermore, an early closure during December-May under

Alternative 3 (Preferred), January-May under **Alternative 4**, November-April under **Alternative 5**, and January-June under **Alternative 6** would protect black sea bass when they are in spawning condition. However, while **Alternative 5** would help to maintain the winter commercial fishery for the black sea bass and provide some relief from the developing derby conditions, a May 1 start for the second half of the fishing year could result in substantial fishing occurring during a portion of peak spawning.

Socioeconomic Impacts

In general, a split season could have commercial economic benefits in that it would allow for two fishing opportunities that could extend the season, break up derby fishing, and perhaps result in higher ex-vessel prices paid to fishermen for their fish. Overall commercial economic benefits cannot be quantified at this time due to a lack of cost data for specific species. However, under the above assumption that a season extension is beneficial, it appears that **Alternative 6** is preferable to the other alternatives followed by **Alternative 5, Alternative 3 (Preferred),** and **Alternative 4** based on the number of weeks fishermen are expected to be able to fish.

The early closures during the early part of the calendar year would result in long-term economic benefits in that the spawning season would be protected. The change in the fishing year under **Alternatives 5** and **6** for the recreational fishery would result in a longer season than if no change were made to the start of the fishing year (**Alternatives 1, 3 (Preferred),** and **4**). This indicates that **Alternatives 5** and **6** would result in short-term economic benefits to the recreational fishery but a decrease in long-term economic benefits due to a decrease in biological benefits.

The need for this action is to address the derby that appears to have developed in the commercial black sea bass fishery and the closures that may occur in the recreational sector as a result of ACL/AM management. Derby conditions (market gluts and accelerated quota closures) and ACL closures are generally expected to result in reduced social and economic benefits compared to fisheries that remain open year-round or are managed with fixed closures because of the increased ability to plan fishing and other activities around a fixed schedule.

Impacts of ACL Carry-Over Alternatives & Gear Restrictions

Biological Impacts

Alternative 7 (Preferred) would allow an unused portion of the quota during the first part of a fishing season to be used in the second portion of the same season while **Alternative 8** would allow the unused portion of a quota during the second portion of a fishing season to be used during the next fishing year. Adding the unused portion of a quota to the following fishing could result in the ACL for the following portion of the fishing year to be exceeded and trigger a reduction in the ACL the year following the overage. Furthermore, if the amount of quota carried forward was large enough, the overfishing threshold could be exceeded and the fishery would be considered to be experiencing overfishing. Therefore, while it is feasible to carry forward an unused portion of a quota from the first part of a fishing year into the second, there are problems associated with carrying quota into a new fishing year. Any reduction of harvest would have increased biological effects and would enhance rebuilding of black sea bass.

Alternatives 9 and **10** would prohibit harvest of black sea bass with pots under the fishing year scenarios described under **Alternatives 3 (Preferred)-6** when all but 100,000 pounds gutted weight and 50,000 pounds gutted weight, respectively, is projected to be landed but would allow harvest of black sea bass with allowable gear types to continue. Both **Alternatives 9** and **10** would be expected to result in early closures when applied to **Alternatives 3 (Preferred)-6.** Harvest of black sea bass with pots would begin again during second part of the fishing specified in **Alternatives 3 (Preferred)-6**, and would continue until the quota is met.

Alternative 11 would close the pot fishery when 90% of the commercial quota is met and allow other gear types to be used until the quota is met. **Alternative 11** would be expected to reduce bycatch mortality of black sea bass to some degree by allowing a small harvest of black sea bass after the majority of the quota has been harvested with pot gear.

> Historically, approximately 90% of the black sea bass harvest has been taken with pots. Landings on trips where hook and line gear is used are very small. Fishermen are able to target black sea bass with pots; however, black sea bass are more likely incidental catch when fishermen use hook and line gear to target co-occurring species.

Socioeconomic Impacts

Both **Alternatives 7 (Preferred)** and **8** would be economically beneficial to fishermen in the short-term. However, if this results in overfishing or interruption of the rebuilding plan, then long-term economic benefits would be negative.

In general, black sea bass pot users would be disadvantaged by **Alternatives 9-11** since those alternatives decrease fishing opportunities for pot gear users compared to **Alternative 1 (No Action)**. However, these alternatives benefit hook and line users. **Alternative 10** is economically preferable to **Alternative 9** for pot users given that pot users can land more black sea bass under **Alternative 10**. **Alternative 11** is economically preferable for pot users than either **Alternative 9** or **10** since it allows access to greater amounts of commercial quota.

Impacts of Spawning Season Closure Alternatives

Biological Impacts

Sub-Alternatives 12a-12d would consider alternatives for various spawning season closures for the commercial and recreational sectors.

In the South Atlantic, black sea bass females spawn during January to June with peak spawning occurring during March-April. However, given the scientific evidence of a south to north progression in spawning, it is likely that peak spawning off of Florida and Georgia occurs earlier than March-April and peak spawning off North Carolina occurs later than March-April.

In terms of biological benefit to black sea bass, the order of sub-alternatives from greatest benefit to least is: **Sub-Alternative 12c; Sub-Alternative 12a; Sub-Alternative 12b; and Sub-Alternative 12d.**

Socioeconomic Impacts

Table S-5 shows the commercial short-term economic effects in the form of foregone dockside revenues of each sub-alternative. **Sub-Alternative 12c** results in the largest loss in dockside revenues while **Sub-Alternative 12d** results in the smallest loss. While the spawning season closures in **Sub-Alternatives 12a** and **12b** are of the same approximate length, **Sub-Alternative 12a** has the larger loss associated with it due to the relatively large amount of black sea bass harvested in March compared to May. On average, 2007-2009 dockside revenues amounted to about $1.6 million for black sea bass.

Table S-5. Dockside revenues foregone as a result of Sub-Alternatives 12a-12d based on 2007-2009 average landings data. Values are in 2009 dollars.

Sub-Alternative	Total revenue loss (ex-vessel revenue)
12a: March 1-April 30	$182,000
12b: April 1-May 31	$96,000
12c: March 1-May 31	$212,000
12d: May 1-May 31	$47,000

With regard to the recreational fishery, short-term economic effects cannot be quantified at this time. However, MRIP data indicate a loss of approximately 70,000 black sea bass on average based on 2007-2009 data as a result of **Sub-Alternative 12a**. Using a value of $31 dollars per fish, this results in a loss of approximately $2.17 million. A loss of 80,000 black sea bass ($2.48 million) is expected under **Sub-Alternative 12b** while 115,000 black sea bass ($3.57 million) and 45,000 sea bass ($1.4 million) would not be caught under **Sub-Alternatives 12c** and **12d**, respectively.

Impacts Bag Limit Alternatives

Biological Impacts

The intent of **Alternative 13** is to increase the social and economic benefits associated with extending the season without having negative biological effects on the black sea bass stock. Adjusting the bag limit would not be expected to have negative biological effects on the stock. Biological protection for the black sea bass stock is provided by the ACL.

An estimated 33% reduction in harvest would be needed to prevent the recreational ACL from being met in the 2010/2011 fishing year. Based on data from the 2008/2009 to the 2010/2011 fishing years, a reduction in the bag limit from 7 to 3 fish per person would be needed to prevent the recreational ACL from being met. **Table S-6** shows when the 409,000 pound ACL would be expected to be met if the bag limit was reduced from 7 to 1 fish per person per day based on reductions in bag limit estimated using data from 2007-2009. Using data from 2010 shows the ACL would be met later in the fishing year because a greater reduction in harvest would be provided by a reduction in the bag limit (**Table S-7**).

Table S-6. Estimated date 409,000 pounds gutted weight ACL would be met based on various bag limit reductions for different fishing years based on bag limit reduction estimates using data from 2007-2009.

Year	Bag 15	Bag 7	Bag 5	Bag 3	Bag 2	Bag 1
2008/09	4-May	27-May	not met	not met	not met	not met
2009/10	8-Apr	18-Apr	28-Apr	25-May	not met	not met
2010/11	1-Jan	5-Feb	6-Mar	24-Apr	not met	not met

Table S-7. Estimated date 409,000 pounds gutted weight ACL would be met based on various bag limit reductions for different fishing years based on bag limit reduction estimates using data from 2010.

Year	Bag 15	Bag 7	Bag 5	Bag 3	Bag 2	Bag 1
2008/09	4-May	not met	not met	not met	not met	not met
2009/10	8-Apr	23-Apr	5-May	not met	not met	not met
2010/11	1-Jan	20-Feb	19-Mar	13-May	not met	not met

The biological effects of the different sub-alternatives are expected to be similar. As discussed in the following sections, the greatest effect of the sub-alternatives will be to increase the social and economic benefits associated with extending the season rather than improve the biological condition of black sea bass.

Socioeconomic Impacts

A 15-fish bag limit would not affect any target trips. A 7-fish bag limit (**Sub-Alternative 13a**) would be expected to affect 11% of private trips, 14% of charter trips, and 12% of shore and headboat trips. A 5-fish bag limit **(Sub-Alternative 13b Preferred)** would be expected to affect 25% of private trips, 20% of charter trips, and 23% of shore and headboat trips. A 3-fish bag limit **(Sub-Alternative 13c)** would be expected to affect 53% of private trips, 62% of charter target trips, and 57% of shore and headboat trips. A 2-fish bag limit **(Sub-Alternative 13d)** would be expected to affect 72% of private trips, 79% of charter target trips, and 75% of shore and headboat trips. A 1-fish bag limit **(Sub-Alternative 13e)** would be expected to affect 86% of private trips, 97% of charter target trips, and 91% of shore and headboat trips.

Table S-8 presents the estimated changes in net operating revenue (NOR) due to trip cancellations during the open season. Although these expected changes would be in addition to the expected changes in NOR associated with the ACL-based closures presented earlier, the two types of effects should not be summed. NOR changes due to ACL-based closures have to be adjusted for the trips that would not take place anyway after the ACL is reached.

Table S-8. Reductions in NOR due to trip cancellations during the open season under various assumptions on the percent of affected trips cancelled.

Alternatives	Fishing Mode	Assumed Percent Cancellation of Affected Trips			
		50%	25%	10%	5%
A.13.0.1	Shore				
	Private				
	Charter	$0	$0	$0	$0
	Headboat	$0	$0	$0	$0
A.13.0.2	Shore				
	Private				
	Charter	$0	$0	$0	$0
	Headboat	$0	$0	$0	$0
A.13.0.3	Shore				
	Private				
	Charter	$0	$0	$0	$0
	Headboat	$0	$0	$0	$0
A.13.1.1	Shore				
	Private				
	Charter	$44,023	$22,012	$8,805	$4,402
	Headboat	$54,015	$27,008	$10,803	$5,402
A.13.1.2	Shore				
	Private				
	Charter	$44,023	$22,012	$8,805	$4,402
	Headboat	$54,015	$27,008	$10,803	$5,402
A.13.1.3	Shore				
	Private				
	Charter	$44,023	$22,012	$8,805	$4,402
	Headboat	$54,015	$27,008	$10,803	$5,402
A.13.2.1	Shore				
	Private				
	Charter	$62,891	$31,445	$12,578	$6,289
	Headboat	$103,529	$51,765	$20,706	$10,353
A.13.2.2	Shore				
	Private				
	Charter	$62,891	$31,445	$12,578	$6,289
	Headboat	$103,529	$51,765	$20,706	$10,353
A.13.2.3	Shore				
	Private				
	Charter	$62,891	$31,445	$12,578	$6,289
	Headboat	$103,529	$51,765	$20,706	$10,353

Table S-8. Continued. Reductions in NOR due to trip cancellations during the open season under various assumptions on the percent of affected trips cancelled.

Alternatives	Fishing Mode	Assumed Percent Cancellation of Affected Trips			
		50%	25%	10%	5%
A.13.3.1	Shore				
	Private				
	Charter	$194,961	$97,481	$38,992	$19,496
	Headboat	$256,572	$128,286	$51,314	$25,657
A.13.3.2	Shore				
	Private				
	Charter	$194,961	$97,481	$38,992	$19,496
	Headboat	$256,572	$128,286	$51,314	$25,657
A.13.3.3	Shore				
	Private				
	Charter	$194,961	$97,481	$38,992	$19,496
	Headboat	$256,572	$128,286	$51,314	$25,657
A.13.4.1	Shore				
	Private				
	Charter	$248,418	$124,209	$49,684	$24,842
	Headboat	$337,595	$168,797	$67,519	$33,759
A.13.5.1	Shore				
	Private				
	Charter	$305,020	$152,510	$61,004	$30,502
	Headboat	$409,615	$204,807	$81,923	$40,961

Action 2: Trip Limit for Vermilion Snapper

Alternative 1 (No Action). Commercial ACL (quota) is 315,523 pounds gw (350,231 pounds ww) during January-June and 302,523 pounds gw (335,800 pounds ww) during July-December. There is no commercial trip limit.

Alternative 2. Establish a 1,000 pounds gw (1,110 pounds ww) commercial trip limit.

Sub-Alternative 2a. Establish a 1,000 pounds gw (1,110 pounds ww) commercial trip limit and reduce to 500 pounds gw (555 pounds ww) when 75% of the ACL (quota) is met or projected to be met.

Alternative 3 (Preferred). Establish a 1,500 pounds gw (1,665 pounds ww) commercial trip limit.

Sub-Alternative 3a. Reduce the trip limit to 500 pounds gw when 75% of the commercial ACL (quota) is met or projected to be met.

Alternative 4. Establish a 750 pounds gw (833 pounds ww) trip limit.

Sub-Alternative 4a. Establish a 750 pounds gw (833 pounds ww) commercial trip limit and reduce to 400 pounds gw (444 pounds ww) when 75% of the commercial ACL (quota) is met or projected to be met.

Alternative 5. Establish a 500 pounds gw (555 pounds ww) commercial trip limit.

Alternative 6. Establish a 400 pounds gw (444 pounds ww) commercial trip limit.

Impacts from Action 2: Trip Limit for Vermilion Snapper

Biological Impacts

When comparing expected landings (in the absence of an ACL) to the split-season ACLs of 302,523 and 315,523 pounds gutted weight, a trip limit between 400 and 500 pounds gutted weight (**Alternatives 5 and 6**) would be needed to keep the fishery open for the entire fishing seasons.

Alternative 1 (No Action) would not implement any regulations to slow down the rate at which the quota is being met for vermilion snapper and provide no relief to derby conditions that may be occurring. **Alternative 1 (No Action)** could have positive biological effects if effort is reduced for long periods of time including a portion of the time of peak spawning, which occurs during June-August. However, **Alternative 1 (No Action)** could also have negative biological effects when fishermen target co-occurring species and discard dead vermilion snapper. **Alternatives 2-6** provide a range of trip limits that could possibly prolong the vermilion snapper fishing season. **Alternative 2, Sub-Alternative 2a,** and **Alternative 3 (Preferred)** were suggested by vermilion snapper commercial fishermen.

Alternative 2 would be expected to extend the fishing season by about three weeks for both July-December and January-June.

Sub-Alternative 2a could extend the fishing season by approximately two additional weeks. This is because many trips are below the 500 pounds gutted weight trip limit.

Alternative 3 (Preferred) could be expected to extend the fishing season by about one to two weeks during both July-December and January-June while **Sub-Alternative 3a** could extend the season by about a month during July-December and 3 weeks during January-June.

Alternative 4 would be expected to extend the fishing by five weeks during the July-December 2009 and January-June 2010 fishing years. Reducing the trip limit to 400 pounds gutted weight when 75% of the ACL is met (**Sub-Alternative 4a**) would be expected to extend the fishing season by about two additional weeks.

Alternative 5 would have been expected to extend the June-December 2009 fishing season through November; whereas during January-June, this trip limit might keep the season open through the end of May due to a lower number of trips and a greater percentage of trips being constrained by the trip limit.

Under the 400 pounds gutted weight trip limit specified in **Alternative 6**, the ACL would likely have been met in December for the June-December 2009 fishing and June during January-June 2010.

Socioeconomic Impacts

It might be expected that a decrease in the trip limit would cause an increase in the number of trips. However, fuel costs and distance traveled to fishing grounds would also be a factor in whether or not fishermen would make more trips. With small trip limits, the cost of fuel moving to and from the fishing grounds could limit profit to the extent that the trip would not be taken.

Individuals from different states could prefer different trip limits depending on distance they have to run to fish for vermilion snapper and number of days at sea needed to make a trip profitable. For instance, during 2008-2009, vessels that landed vermilion snapper in Georgia had the highest landings and spent the greatest number of days at sea. The shortest trip length and smallest average catch of vermilion snapper occurred in North Carolina.

Revenue loss estimates for five regions in the South Atlantic are provided in **Table S-9.** These are short-term economic effects. It appears that low vermilion trip limits (**Alternative 6**) will impact North Carolina and Georgia and Northeast Florida the most with some effects felt in South Carolina. The remainder of the alternatives result in larger revenue losses in Georgia and Northeast Florida than in North Carolina, although the differences are relatively small.

Table S-9. Dockside revenues foregone as a result of Alternatives 2-6 based on 2007-2009 average landings data, by state for vermilion snapper.
Dollar values are in 2009 dollars. Pounds are gutted weight.

Alt/Sub-Alt	North Carolina	South Carolina	Georgia and Northeast Florida	Southeast Florida	Florida Keys
2: 1,000 pounds	$232,000	$51,000	$327,000	$1,000	$0
2a: 1,000 pounds reduced to 500 pounds when 75% of quota is met	$310,000	$83,000	$389,000	$1,000	$0
3 (Preferred): 1,500 pounds	$117,000	$14,000	$176,000	$0	$0
3a: 1,500 pounds and reduced to 500 pounds when 75% of quota is met	$223,000	$55,000	$276,000	$0	$0

Table S-9. Continued. Dockside revenues foregone as a result of Alternatives 2-6 based on 2007-2009 average landings data, by state for vermilion snapper.
Dollar values are in 2009 dollars. Pounds are gutted weight.

Alt/Sub-Alt	North Carolina	South Carolina	Georgia and Northeast Florida	Southeast Florida	Florida Keys
4: 750 pounds	$347,000	$95,000	$437,000	$1,000	$0
4a: 750 pounds reduced to 500 pounds when 75% of quota is met	$424,000	$128,000	$488,000	$1,000	$1,000
5: 500 pounds	$544,000	$180,000	$575,000	$2,000	$1,000
6: 400 pounds	$654,000	$229,000	$641,000	$2,000	$2,000

The economic analysis for this action cannot account for the fact that a vessel may make more trips as a result of a smaller trip limit. As expected, however, as trip limits increase, so do revenue losses. Revenue losses would be highest for **Alternative 6** and lowest for **Alternative 3 (Preferred).** However, trip limits can also result in a longer season which could increase ex-vessel prices and ultimately result in higher profits for some fishermen, and perhaps the fishery overall. Available data do not support a definitive quantitative determination of which trip limit alternative would achieve the best social and economic results, however.

Action 3: Trip Limit for Gag

Alternative 1 (No Action). ACL (quota) is 352,940 pounds gutted weight. Seasonal closure occurs during January-April. There is no trip limit.

Alternative 2 (Preferred). Establish a 1,000 pounds gw (1,180 pounds ww) trip limit.

> **Sub-Alternative 2a.** Establish a 1,000 pounds gw (1,180 pounds ww) trip limit and reduce to 100 pounds gw (118 pounds ww) when 75% of the commercial ACL (quota) is met or projected to be met.

Alternative 3. Establish a 750 pounds gw (885 pounds ww) trip limit.

> **Sub-Alternative 3a.** Establish a 750 pounds gw (885 pounds ww) trip limit and reduce to 100 pounds gw (118 pounds ww) when 75% of the commercial ACL (quota) is met or projected to be met.

Alternative 4. Establish a 1,000 pounds gw (1,180 pounds ww) (or the appropriate head count) trip limit with a season starting on May 1 and reduce the trip limit to 100 pounds gw (118 pounds ww) when 90% of the commercial ACL (quota) is met or projected to be met.

Impacts from Action 3: Trip Limit for Gag

Biological Impacts

Although the gag landings did not exceed the quota during 2009, it is possible effort could increase during 2010 due to closures for vermilion snapper and black sea bass. **Table S-10** shows the effect of proposed trips limits in **Alternatives 1 through 4** on gag landings during May-December 2007.

Table S-10. Expected cumulative landings of gag during May-December 2007 for various trip limit alternatives (in pounds).

Month	Alt 1	Alt 2 1,000	Alt 3 750	Alt 3a 750 to 100	Alt 4 1,000 to 100
5	74,653	64,330	57,889	57,889	64,330
6	159,990	140,646	128,546	128,546	140,646
7	210,544	187,406	172,614	172,614	187,406
8	253,901	229,898	212,997	212,997	229,898
9	280,097	255,809	238,532	238,532	255,809
10	311,799	284,241	265,336	264,489	284,241
11	352,959	322,566	302,097	281,279	307,491
12	415,753	380,706	356,598	303,479	329,691
quota met	30-Nov	14-Dec	31-Dec		
75% met	17-Sep	15-Oct	29-Oct		
90% met		9-Nov			

If future landings were similar to those in 2007, a 1,000 pounds gutted weight trip limit (**Alternative 2 Preferred)** would not keep the season open all year. However, if the 1,000 pounds gutted weight trip limit was reduced to 100 pounds gutted weight (**Sub-Alternative 2a**) when 75% of the quota was met, the quota would come within 30,000 pounds of being met.

Under **Alternative 3** (750 pounds gutted weight), the gag fishery would be expected to remain open until the end of December. The quota would not be met under the remaining alternatives. **Alternative 4** would establish a 1,000 pounds gutted weight trip limit that would be reduced to 100 pounds gutted weight when 90% of the quota is expected to be met. Based on 2007 conditions, 90% of the quota would be met in November. The biological effects of the alternatives would be least for **Alternative 1 (No Action)** and greatest for **Sub-Alternative 3a**, which would allow for the least amount of harvest.

Socioeconomic Impacts

Lower trip limits result in greater losses in ex-vessel revenues with **Sub-Alternative 3a** having the greatest negative short-term economic effects followed by **Sub-Alternative 2a, Alternative 4, Alternative 3,** and **Alternative 2 (Preferred)** based on landings made in previous years. As stated above, however, the methodologies used do not account for fishermen increasing the number of trips they take in reaction to implementation of a trip limit. Actual changes in profits cannot be estimated at this time due to a lack of cost data for particular species. Therefore, it is not known which of the alternatives ultimately results in a more economically preferable outcome since lower trip limits could result in higher ex-vessel prices.

The same concerns with respect to the proposed trip limits for black sea bass and vermilion snapper would apply here: while trip limits may extend the length of the fishing season, they would be expected to alter the profitability of some trips, jeopardizing normal fishing behavior, revenues, and social benefits, unless other species are targeted on the same trip to compensate.

South Carolina and Georgia and Northeast Florida are most negatively economically affected by trip limits for gag. While **Alternative 2 (Preferred)** has an equal impact on South Carolina and Georgia and Northeast Florida, **Sub-Alternatives 2a** and **3a** have a greater negative effect on South Carolina since the average gag pounds per trip harvested in South Carolina are greater than the average gag pounds harvested per trip in Georgia and Northeast Florida (**Table S-11**). Economic effects of **Alternative 4** fall in between those of **Alternative 2 (Preferred)** and **Sub-Alternative 2a**. An actual revenue loss value cannot be estimated given the change in the fishing year start date.

Table S-11. Dockside revenues foregone as a result of Alternatives 2-4 based on 2007-2009 average landings for gag grouper, by state.
Dollar values are in 2009 dollars. Pounds are gutted weight.

Alt/Sub-Alt	North Carolina	South Carolina	Georgia Northeast Florida	Southeast Florida	Florida Keys
2 (Preferred): 1,000 pounds	**$1,000**	**$48,000**	**$48,000**	**$5,000**	**$0**
2a: 1,000 pounds reduced to 100 pounds when 75% of quota is met	$10,000 (2007 season), $5,000 (2009 season)	$203,000 (2007 season), $105,000 (2009 season)	$157,000 (2007 season), $82,000 (2009 season)	$21,000 (2007 season, $11,000 (2009 season)	$0 (2007 season, $0 (2009 season)
3: 750 pounds	$5,000	$100,000	$78,000	$11,000	$0
3a: 750 pounds reduced to 100 pounds when 75% of quota is met	$12,000 (2007 season), $6,000 (2009 season)	$242,000 (2007 season), $118,000 (2009 season)	$187,000 (2007 season), $91,000 (2009 season)	$26,000 (2007 season, $12,000 (2009 season)	$0 (2007 season, $0 (2009 season)
4: 1,000 pounds with season starting May 1 reduced to 100 pounds when 90% of quota is met	Less than Alternative 2a but greater than Alternative 2	Less than Alternative 2a but greater than Alternative 2	Less than Alternative 2a but greater than Alternative 2	Less than Alternative 2a but greater than Alternative 2	Less than Alternative 2a but greater than Alternative 2

Action 4: Trip Limit for Greater Amberjack

Alternative 1 (No Action). Retain the current commercial regulations for greater amberjack in the South Atlantic

Alternative 2. Change the commercial trip limit for greater amberjack.

Sub-Alternative 2a. Increase the greater amberjack commercial trip limit to 2,000 pounds gw.

Sub-Alternative 2b. Increase the greater amberjack commercial trip limit to 1,500 pounds gw.

Sub-Alternative 2c (Preferred). Increase the greater amberjack commercial trip limit to 1,200 pounds gw.

Impacts from Action 4: Trip Limit for Greater Amberjack

Biological Impacts

Among the proposed alternatives, **Alternative 1 (No Action)** would have the greatest positive biological effect since it would not result in an increased harvest of greater amberjack. **Sub-Alternative 2a**, which would allow for the largest increase in the trip limit, would have the greatest negative biological effect on the species. However, the recent assessment indicates the stock is not overfished and is not experiencing overfishing. Based on data from the 2008 fishing year, the commercial quota of 1,169,931 pounds gutted weight quota would not be reached with either the 2,000 pounds trip limit proposed under **Sub-Alternative 2a**, the 1,500 pounds trip limit proposed under **Sub-Alternative 2b**, or the 1,200 pounds trip limit proposed under **Sub-Alternative 2c (Preferred).** Effort could increase on greater amberjack due to restrictions proposed in Amendments 17A (SAFMC 2010a) and 17B (SAFMC 2010b). This could result in the quota being met before the fishing year is completed. Since SEDAR 15 (2008) indicates release mortality rate of greater amberjack is low (20%), high mortality of greater amberjack after a quota was met would not be likely. The biological effect of **Sub-Alternative 2b** would be intermediate between **Alternative 1 (No Action)** and **Sub-Alternative 2a**. Therefore, none of the alternatives are expected to have negative biological effects on the stock of greater amberjack.

Socioeconomic Impacts

Because the greater amberjack alternatives propose an increase in trip limits, there are no ex-vessel revenue losses expected as a result of these alternatives. In general, larger trip limits should be beneficial to commercial fishermen unless the quota is filled more quickly and the season becomes shorter. The key is the effect of larger trip limits on the length of the fishing season. We cannot determine with current logbook data how the frequency distribution of pounds per trip would change with larger trip limits, and hence do not know if larger trip limits are likely to result in shorter seasons. **Sub-Alternatives 2a, 2b,** and **2c** are expected to result in short-term economic benefits unless the season is shortened. If greater amberjack target effort increases in response to increased restrictions on other species, the moderate increase in the trip limit that would occur under **Alternative 2c (Preferred)** may result in a better social and economic outcome than the other alternatives by allowing the increased benefits associated with the increase in the trip limit while avoiding potential problems associated with rapid increases in participation that could be attracted by higher trip limits, and lower prices that could result from increased harvest flow through markets.

1.0 Introduction

Management of the Federal snapper grouper fishery located off the South Atlantic in the 3-200 nautical mile (nm) U.S. Exclusive Economic Zone (EEZ) is conducted under the Fishery Management Plan (FMP) for the Snapper Grouper Fishery of the South Atlantic Region (SAFMC 1983) (**Figure 1-1**). This area encompasses approximately 190,223 square miles (492,674 km^2). The FMP and its amendments are developed under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), other applicable Federal laws (**Appendix F**), and executive orders (E.O.s) and affect the management of 73 species, listed in **Table 1-1**.

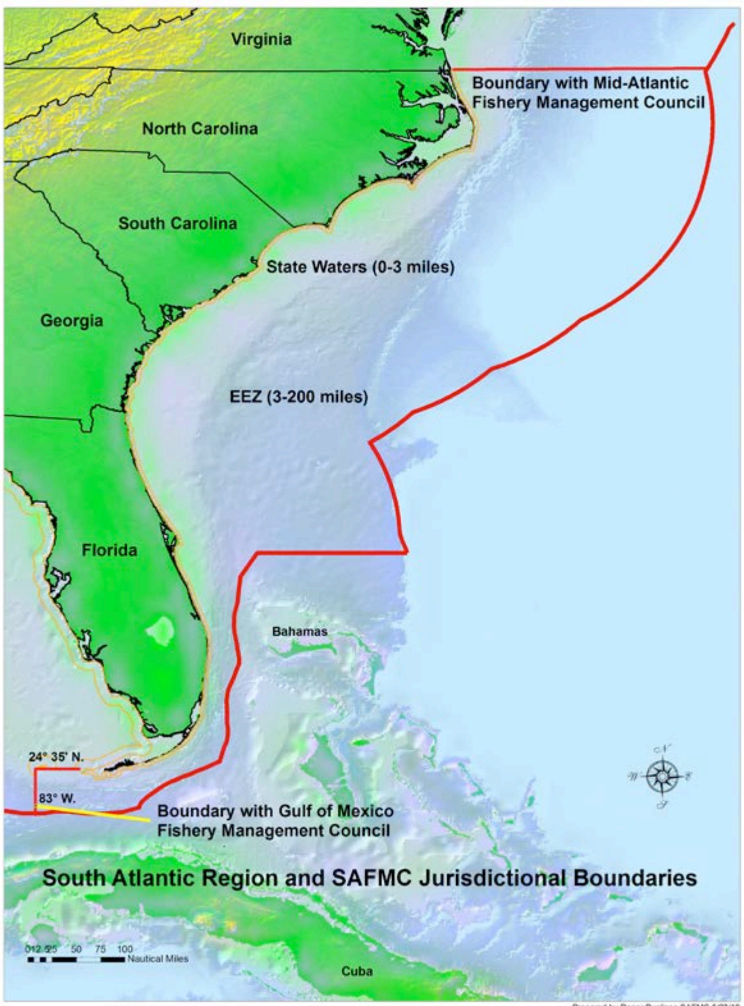


Figure 1-1. Jurisdictional boundaries of the South Atlantic Fishery Management Council.

Table 1-1. Species in the Snapper Grouper FMU.

Almaco jack, *Seriola rivoliana*
Atlantic spadefish, *Chaetodipterus faber*
Banded rudderfish, *Seriola zonata*
Bank sea bass, *Centropristis ocyurus*
Bar jack, *Carangoides ruber*
Black grouper, *Mycteroperca bonaci*
Black margate, *Anisotremus surinamensis*
Black sea bass, *Centropristis striata*
Black snapper, *Apsilus dentatus*
Blackfin snapper, *Lutjanus buccanella*
Blue runner, *Caranx crysos*
Blueline tilefish, *Caulolatilus microps*
Bluestriped grunt, *Haemulon sciurus*
Coney, *Cephalopholis fulva*
Cottonwick, *Haemulon melanurum*
Crevalle jack, *Caranx hippos*
Cubera snapper, *Lutjanus cyanopterus*
Dog snapper, *Lutjanus jocu*
French grunt, *Haemulon flavolineatum*
Gag, *Mycteroperca microlepis*
Golden tilefish, *Lopholatilus chamaeleonticeps*
Goliath grouper, *Epinephelus itajara*
Grass porgy, *Calamus arctifrons*
Gray (mangrove) snapper, *Lutjanus griseus*
Gray triggerfish, *Balistes capriscus*
Graysby, *Cephalopholis cruentata*
Greater amberjack, *Seriola dumerili*
Hogfish, *Lachnolaimus maximus*
Jolthead porgy, *Calamus bajonado*
Knobbed porgy, *Calamus nodosus*
Lane snapper, *Lutjanus synagris*
Lesser amberjack, *Seriola fasciata*
Longspine porgy, *Stenotomus caprinus*
Mahogany snapper, *Lutjanus mahogoni*
Margate, *Haemulon apoundsum*
Misty grouper, *Epinephelus mystacinus*
Mutton snapper, *Lutjanus analis*
Nassau grouper, *Epinephelus striatus*
Ocean triggerfish, *Canthidermis sufflamen*
Porkfish, *Anisotremus virginicus*
Puddingwife, *Halichoeres radiatus*
Queen snapper, *Etelis oculatus*
Queen triggerfish, *Balistes vetula*
Red grouper, *Epinephelus morio*
Red hind, *Epinephelus guttatus*
Red porgy, *Pagrus pagrus*
Red snapper, *Lutjanus campechanus*
Rock hind, *Epinephelus adscensionis*
Rock Sea Bass, *Centropristis philadelphica*
Sailors choice, *Haemulon parra*
Sand tilefish, *Malacanthus plumieri*
Saucereye porgy, *Calamus calamus*
Scamp, *Mycteroperca phenax*
Schoolmaster, *Lutjanus apodus*
Scup, *Stenotomus chrysops*
Sheepshead, *Archosargus probatocephalus*
Silk snapper, *Lutjanus vivanus*
Smallmouth grunt, *Haemulon chrysargyreum*
Snowy grouper, *Epinephelus niveatus*
Spanish grunt, *Haemulon macrostomum*
Speckled hind, *Epinephelus drummondhayi*
Tiger grouper, *Mycteroperca tigris*
Tomtate, *Haemulon aurolineatum*
Yellow jack, *Carangoides bartholomaei*
Yellowedge grouper, *Epinephelus flavolimbatus*
Yellowfin grouper, *Mycteroperca venenosa*
Yellowmouth grouper, *Mycteroperca interstitialis*
Yellowtail snapper, *Ocyurus chrysurus*
Vermilion snapper, *Rhomboplites aurorubens*
Warsaw grouper, *Epinephelus nigritus*
White grunt, *Haemulon plumierii*
Whitebone porgy, *Calamus leucosteus*
Wreckfish, *Polyprion americanus*

1.1 Purpose of the Proposed Action

The ***purpose*** of this amendment is to prevent the progressive shortening of fishing seasons for black sea bass, vermilion snapper, and gag, and maximize the probability of reaching optimum yield for greater amberjack. This would be accomplished through: the establishment of trip limits for black sea bass, vermilion snapper, and gag; split season quotas, a spawning season closure for black sea bass; a reduction in the black sea bass bag limit, and modifying the current trip limit for greater amberjack under the current Framework Procedure for Setting Total Allowable Catch for Snapper Grouper (Framework).

1.2 Need for the Proposed Action

The ***need*** for this action is to comply with the Magnuson-Stevens Fishery Conservation and Management Act's national standards, to ensure equity in harvest opportunities, and promote safety at sea through the prevention of derby style fisheries, while minimizing adverse socioeconomic impacts.

1.3 Background

Black Sea Bass

Black sea bass is undergoing overfishing and being managed under a rebuilding plan. Management measures to rebuild the stock are currently in place, including a commercial quota and recreational allocation, now referred to as annual catch limits (ACLs). Seven other snapper grouper species are also undergoing overfishing. Harvest restrictions placed on those, and other co-occurring species such as vermilion snapper and gag, has led to effort shifts to fisheries such as black sea bass. Because black sea bass, vermilion snapper, and gag are managed with commercial quotas, which have been established in recent years to end overfishing, effort shifts to those fisheries have resulted in their respective quotas being met earlier each year. The June-May commercial fishing year for black sea bass closed on December 20, 2009, and October 6, 2010, and the recreational annual catch limit (ACL) was met in February 2011.

Amendment 13C (SAFMC 2006) to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region implemented management measures to reduce harvest of black sea bass by 35%. The total allowable catch (TAC) was reduced to 847,000 pounds whole weight, and of that TAC, 309,000 pounds gutted weight was allocated to the commercial sector as the annual commercial quota. After the quota is met all pots are required to be removed from the water. The fishing season was also changed from the calendar year to June 1 through May 31. Additionally, the bag limit was reduced from 20 to 15 black sea bass per person per day and the minimum size limit for the recreational sector was increased to 12 inches total length. Amendment 17B (SAFMC 2010b) implemented accountability measures for the recreational sector, which include prohibiting recreational harvest when the recreational ACL is projected to be met (if black sea bass are considered overfished), and reducing the recreational ACL for the fishing season following an ACL overage by the amount of the overage.

Gag

Amendment 16 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (SAFMC 2009a) implemented a new commercial quota for gag (352,940 pounds gutted weight) which was intended to initially reduce commercial harvest by 35%. In addition to reducing the quota for gag, Amendment 16 also included a management measure that prohibits all harvest of shallow water grouper when the gag quota is met. Amendment 17B (SAFMC 2010b), was approved in December 2010 and established a group commercial ACL for gag, red grouper, and black grouper, of 662,403 pounds gutted weight. The group commercial ACL is equivalent to the expected catch resulting from the implementation of management measures for red grouper and black grouper in Amendment 16 and the gag ACL, which is the same as the quota, specified in Amendment 16. Commercial possession of shallow water groupers is prohibited when either the gag or the group (gag, black grouper, and red grouper) ACL is projected to be met. The low quota combined with a rebuilding stock, could lead to the quota being met more and more quickly over time, encouraging a derby-style fishery to form.

Vermilion Snapper
Overfishing of vermilion snapper during 1999-2001 was addressed in Amendment 13C (SAFMC 2006). At that time it was unclear if vermilion snapper were overfished in addition to experiencing overfishing because of a poorly defined stock recruitment relationship. Therefore, the Council and the Council's Scientific and Statistical Committee (SSC) felt it was best to account for this uncertainty by capping commercial landings at 1,100,000 pounds, which was slightly lower than the commercial portion of optimum yield (1,114,310 pounds gutted weight), until the 2007 stock assessment was completed.

A new aged-based assessment for vermilion snapper completed in 2008 verified vermilion snapper was experiencing overfishing but indicated the overfished status of the stock was unknown. Based on the results of the new assessment, Amendment 16 (SAFMC 2009a) reduced commercial harvest of vermilion snapper by 29%, and implemented a split season quota 315,523 pounds gutted weight during January through June, and 302,523 pounds gutted weight from July through December. Additionally, recreational harvest of vermilion snapper is prohibited from November through March each year. In 2010, the January through June quota was met on March 19, 2010, and the July through December on October 7, 2010. The quota closure could occur even earlier in 2011 if no trip limits are implemented.

Greater Amberjack
Amendment 9 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (SAFMC 1998a) established measures for greater amberjack that: reduced the recreational bag limit from 3 to 1 greater amberjack per person per day; maintained the prohibition on harvest and possession in excess of the bag limit during April; established a quota at 63% of 1995 landings (quota=1,169,931 pounds gutted weight); began the fishing year on May 1; prohibited sale of fish harvested under the bag limit when the season is closed; and prohibited coring. Currently, there is a 1,000-pounds gutted weight trip limit, which is effective each year until the quota is reached. Since the trip limit was implemented, the commercial quota for greater amberjack has never been reached. With increased restrictions on other snapper grouper species through Amendments 13C and 16, there has been an interest in increasing the trip limit for greater amberjack in order to maximize the probability of reaching optimum yield for the species.

Framework Actions
The current Framework Procedure for Setting Total Allowable Catch for Snapper Grouper (Framework) allows for adjustments to be made to harvest parameters such as quotas, trip limits, bag limits, size limits, and seasonal or area closures via regulatory amendment. Regulatory

amendments are the type of amendment associated with implementing framework actions. Regulatory amendments require less time to implement than a standard fishery management plan amendment, and are effective until modified unlike temporary or emergency rules. Framework actions are implemented by the Regional Administrator and require less public and Council participation when compared to the lengthy amendment process. The majority of public participation and Council discussion on framework issues typically takes place when the framework procedures are initially drafted during the amendment process. Eliminating these time-consuming factors would enable harvest modifications to be expedited when they are most needed. The overall harvest limitations for black sea bass, gag, and vermilion snapper were implemented through the amendments mentioned above, which were subjected to many levels of Council and public input. Therefore, establishing trip limit or split season quotas within the bounds of the previously set harvest levels fall within the scope of adjustments that can be made through regulatory amendment.

1.4 History of Management for Black Sea Bass, Gag , Greater Amberjack, and Vermilion Snapper

The snapper grouper fishery is highly regulated; some of the species included in this Fishery Management Plan (FMP) have been regulated since 1983. A detailed history of management for all species in the snapper grouper fishery management unit may be found in **Appendix H**. Below is an annotated list of FMP amendments that contained actions specifically related to black sea bass, vermilion snapper, and gag.

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

The original Fishery Management Plan (SAFMC 1983) included provisions to prevent growth overfishing in thirteen species in the snapper grouper complex and established a procedure for preventing overfishing in other species; established minimum size limits for red snapper, yellowtail snapper, red grouper, Nassau grouper, and black sea bass, a 4" trawl mesh size to achieve a 12" total length minimum size limit for vermilion snapper; and included additional harvest and gear limitations. Regulatory Amendment 1 (SAFMC 1987) implemented special management zones (SMZ) off South Carolina and Georgia.

Amendment 4 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region

Amendment 4 (SAFMC 1991) prohibited the use of various gear, including fish traps, the use of bottom longlines for wreckfish, and powerheads in special management zones off South Carolina; established bag limits and minimum size limits for several species; established income requirements to qualify for permits; and required that all snapper grouper species possessed in South Atlantic Federal waters must have heads and fins intact through landing.

Regulatory Amendment 5 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region

Regulatory Amendment 5 (SAFMC 1992) modified the definition of black sea bass pots, allowed multi-gear trips, and allowed retention of incidentally caught fish.

Amendment 9 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region

Amendment 9 (SAFMC 1998a) imposed the following regulatory changes for black sea bass, vermilion snapper, gag, and greater amberjack: 1) Increased the black sea bass minimum size limit from 8" TL to 10" TL for both recreational and commercial fishermen, established a recreational bag limit of 20 black sea bass per person per day, required escape vents and escape panels with degradable fasteners in black sea bass pots; 2) increased the recreational vermilion snapper minimum size limit from 10" to 11" TL and retained the current 10-fish bag limit; 3) increased the gag minimum size limit from 20" TL to 24" TL for both recreational and commercial fishermen, prohibited harvest and possession of gag in excess of the bag limit during March and April, prohibited purchase and sale of gag during March and April, and specified that within the 5-fish aggregate grouper bag, no more than 2 fish may be gag or black grouper (individually or in combination); and 4) established measures for greater amberjack that reduced the recreational bag limit from 3 to 1 greater amberjack per person per day, maintained the prohibition on harvest and possession in excess of the bag limit during April, established a quota at 63% of 1995 landings (quota=1,169,931 pounds), began the fishing year on May 1, prohibited sale of fish harvested under the bag limit when the season is closed, and prohibited coring.

Amendment 11 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region

Amendment 11 (SAFMC 1998c) amended the FMP to make definitions of maximum sustainable yield (MSY), optimum yield, overfishing, and overfished consistent with "National Standard Guidelines". Amendment 11 also identified and defined fishing communities and addressed bycatch management measures.

Amendment 13C to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region

Amendment 13C (SAFMC 2006) to the Snapper Grouper FMP became effective October 23, 2006. The amendment addresses overfishing for snowy grouper, golden tilefish, black sea bass, and vermilion snapper.

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

Amendment 15A (SAFMC 2008a) to the Snapper Grouper FMP became effective on March 14, 2008. The amendment was developed by the Council to: 1) update management reference points for snowy grouper, black sea bass, and red porgy; 2) modify rebuilding schedules for snowy grouper and black sea bass; 3) define rebuilding strategies for snowy grouper, black sea bass, and red porgy; and 4) redefine the minimum stock size threshold for the snowy grouper stock.

Amendment 16 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region

Amendment 16 (SAFMC 2009a) includes measures to end overfishing for gag and vermilion snapper. For **gag** these measures include: 1) define interim allocations based on landings at 51% commercial and 49% recreational; 2) establish a January through April spawning season closure for gag for both commercial and recreational sectors where no fishing for and/or possession of gag would be allowed. In addition, during the closure no fishing for and/or possession of the following species would be allowed: black grouper, red grouper, scamp, red hind, rock hind, yellowmouth grouper, tiger grouper, yellowfin grouper, graysby, and coney; 3) establish a directed commercial quota of 352,940 pounds (gutted weight); 3) reduce the current 5-grouper aggregate recreational bag limit to a 3-grouper aggregate bag limit and reduce the existing bag limit from 2 gag or black grouper to 1 gag or black grouper combined; and 4) exclude the captain and crew on for-hire vessels from possessing a bag limit for groupers. For vermilion snapper these measures include: 1) define interim allocations based on landings of 68% commercial and 32% recreational; 2) establish a commercial quota of 315,523 pounds gutted weight January through June; and 302,523 pounds gutted weight July through December; 3) reduce the recreational bag limit from 10 fish to 5 fish; and 4) establish a recreational closed season November through March.

<u>Amendment 17B to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region</u>

Amendment 17B (SAFMC 2010b) specifies Annual Catch Limits (ACLs) and Accountability Measures (AMs) for eight species in the snapper grouper management complex currently listed as undergoing overfishing (golden tilefish, snowy grouper, speckled hind, warsaw grouper, black sea bass, gag, red grouper, and vermilion snapper). Amendment 17B also includes actions for black grouper, which has recently been determined to not be overfished or experiencing overfishing. Measures in Amendment 17B include the establishment of a combined ACL for gag, black grouper, and red grouper of 662,403 pounds (gutted weight) for the commercial fishery, and 648,663 pounds (gutted weight) for the recreational fishery, and establishment of accountability measures as necessary.

<u>Amendment 18A to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region</u>

Amendment 18A (under development) currently includes several management alternatives including modifications to the black sea bass pot and golden tilefish fisheries as well as actions to improve data collection.

1.5 Management Objectives

Objectives of the Snapper Grouper FMP, as modified through Amendment 17A (SAFMC 2010a), are shown below.

1. Prevent overfishing.
2. Collect necessary data.
3. Promote orderly utilization of the resource.
4. Provide for a flexible management system.
5. Minimize habitat damage.
6. Promote public compliance and enforcement.
7. Mechanism to vest participants.
8. Promote stability and facilitate long run planning.
9. Create market-driven harvest pace and increase product continuity.
10. Minimize gear and area conflicts among fishermen.
11. Decrease incentives for overcapitalization.
12. Prevent continual dissipation of returns from fishing through open access.
13. Evaluate and minimize localized depletion.
14. End overfishing of snapper grouper stocks undergoing overfishing.
15. Rebuild stocks declared overfished.

2.0 Actions and Alternatives

Action 1. Harvest Management Measures for Black Sea Bass

Alternative 1 (No Action). Do not implement harvest management measures to reduce the rate at which the quota for black sea bass is being met.

Alternative 2. Establish a commercial trip limit for the black sea bass fishery (all gear).

- **Sub-Alternative 2a.** Establish a 500 pounds gw (590 pounds ww) trip limit.
- **Sub-Alternative 2b.** Establish a 750 pounds gw (885 pounds ww) trip limit.
- **Sub-Alternative 2c.** Establish a 1,000 pounds gw (1,180 pounds ww) trip limit.
- **Sub-Alternative 2d.** Establish a 1,250 pounds gw (1,475 pounds ww) trip limit.
- **Sub-Alternative 2e.** Establish a 1,000 pounds gw (1,180 pounds ww) trip limit; reduce to 500 pounds gutted weight (590 pounds ww) when 75% of the ACL (quota) is met.
- **Sub-Alternative 2f.** Establish a 2,000 pounds gw (2,360 pounds ww) trip limit.
- **Sub-Alternative 2g.** Establish a 2,500 pounds gw (2,950 pounds ww) trip limit.
- **Sub-Alternative 2h.** Establish a 340 pounds gw trip limit.

Alternative 3 (Preferred). Retain the June-May fishing year. Specify separate commercial ACL (quota) for June-November and December-May based on landings from 2006-2009.

Alternative 4. Retain the June-May fishing year. Specify commercial ACLs (quotas) for June-December and January-May based on landings from 2006-2009.

Alternative 5. Change the black sea bass fishing year to November-October. Specify separate commercial ACLs (quotas) for November-April 30 and May 1-October based on landings from 2006-2009.

Alternative 6. Change the black sea bass fishing year to January-December. Separate commercial ACLs (quotas) for January-June and July-December based on landings from 2006-2009.

Alternative 7 (Preferred). Under Alternatives 3-6, carry over unused portion of commercial ACL (quota) from first part of fishing year to second portion of season.

Alternative 8. Under Alternatives 3-6, carry over unused portion of commercial ACL (quota) from second part of fishing year to next fishing year.

Alternative 9. Under Alternatives 3-6, close fishing for black sea bass with pots when all but 100,000 pounds of the commercial ACL (quota) is harvested. Fishing with other allowable gear types would occur for the remainder of the sub-season. Start second season for the remainder of the ACL (quota) for all allowable gear types.

Alternative 10. Under Alternatives 3-6, close fishing for black sea bass with pots when all but 50,000 pounds of the commercial ACL (quota) is harvested. Fishing with other allowable gear types would occur for the remainder of the sub-season. Start second season for the remainder of the ACL (quota) for all allowable gear types.

Alternative 11. Close the pot fishery when 90% of the commercial ACL (quota) is met.

Alternative 12. Establish a spawning season closure for black sea bass.

Sub-Alternative 12a. Implement a March 1-April 30th spawning season closure for black sea bass, would apply to commercial and recreational sectors.

Sub-Alternative 12b. Implement an April 1st-May 31st spawning season closure for black sea bass, would apply to commercial and recreational sectors.

Sub-Alternative 12c. Implement a March 1st- May 31st spawning season closure for black sea bass, would apply to commercial and recreational sectors.

Sub-Alternative 12d. Implement a May 1st- May 31st spawning season closure for black sea bass, would apply to commercial and recreational sectors.

Alternative 13. Modify the recreational bag limit for black sea bass

Sub-Alternative 13a. Reduce the recreational bag limit from 15 to 7 black sea bass per person per day.

Sub-Alternative 13b (Preferred). Reduce the recreational bag limit from 15 to 5 black sea bass per person per day.

Sub-Alternative 13c. Reduce the recreational bag limit from 15 to 3 black sea bass per person per day.

Sub-Alternative 13d. Reduce the recreational bag limit from 15 to 2 black sea bass per person per day.

Sub-Alternative 13e. Reduce the recreational bag limit from 15 to 1 black sea bass per person per day.

Comparison of Alternatives

Alternative 1 (No Action) would not implement any regulations to slow down the rate at which the quota is being met for black sea bass. **Alternative 2** would consider a single trip limit for black sea bass harvested with pot and hook and line. Based on estimated data for the June 2009-May 2010 fishing year, a 500 pounds gutted weight trip limit (**Sub-Alternative 2a**) would keep the fishery open through February 2010 and about six weeks longer than **Alternative 1 (No Action).** Trip limits of 750 to 1,250 pounds gutted weight would result in January closures (**Sub-Alternatives 2b-2d**), and **Sub-Alternative 2e**, which would reduce a 1,000 pounds gutted weight trip limit to 500 pounds gutted weight when 75% of the quota is met would have a similar effect as **Sub-Alternative 2a**. **Sub-Alternative 2f** would establish a 2,000 pounds gutted weight (2,360 pounds whole weight) trip limit. Under **Sub-Alternative 2f** the expected quota closure dates would be almost identical to the **Alternative 1 (No Action)** and would have little effect of extending the black sea bass fishery. **Sub-Alternative 2g** would establish a 2,500 pounds gutted weight (2,775 pounds whole weight) tip limit. As with **Sub-Alternative 2f**, a 2,500 pounds trip limit would provide little effect on extending the fishing season for black sea bass. **Alternative 2h** would specify a trip limit that would allow the black sea bass fishery to remain open throughout the June-May fishing year.

Under **Alternative 3 (Preferred)**, the second portion of the fishing season would begin in December when fish houses usually close for Christmas (Tom Burgess, pers. com.). **Alternative 5** would change the fishing year to November-October and divide the fishing season into November-April and May-October. The commercial quota would be apportioned into seasons based on average landings from 2006-2009. While this alternative would help to maintain the winter commercial fishery for black sea bass and provide some relief from the developing derby conditions, a May 1 start for the second half of the fishing year could result in substantial fishing occurring during a portion of peak spawning. Splitting the harvest season into two components under **Alternatives 3 (Preferred)-6** would allow black sea bass fishermen to capitalize on the resources over a longer period of time, rather than in one compressed season. Establishing two commercial fishing seasons would ensure the fishery two distinct opportunities for harvest. **Alternatives 3 (Preferred)-6** would not set a trip limit so there would not be a problem with fishermen unexpectedly exceeding the trip limit and having to release black sea bass from pots, which could result in some discard mortality. Given the current level of fishing pressure, the quotas would be expected to be met early during each fishing season for the four sub-alternatives. This would result in periods of time of no fishing for black sea bass with pots, which would have a positive biological effects for black sea bass, which is overfished and in a rebuilding plan, as well as protected species that have the potential of becoming entangled in pot lines. Furthermore, an early closure during December-May under **Alternative 3 (Preferred)**, January-May under **Alternative 4**, November-April under **Alternative 5**, and January-June under **Alternative 6** would protect black sea bass when they are in spawning condition. Opening black sea bass during November, December, and January under **Alternatives 3 (Preferred)-6** could increase the possibility of entanglement with right whales since this is the time of year when they may occur off the South Atlantic states.

Alternative 7 (Preferred) would allow an unused portion of a quota during the first part of a fishing season to be used in the second portion of the same season. **Alternative 8** would allow an unused portion of a quota during the second portion of a fishing season to be used during the next fishing year. Adding the unused portion of a quota to the following fishing year could result in the ACL specified for the fishing year to be exceeded and trigger AMs. Furthermore, if the amount of quota carried forward was large enough, the ABC or OFL could be exceeded and the fishery would be considered to be experiencing overfishing. Therefore, while it is feasible to carry forward an unused portion of a quota from the first part of a fishing year into the second, there are problems associated with carrying quota into a new fishing year.

Alternative 9 would be expected to result in early closures when applied to **Alternatives 3 (Preferred)-6**. Closures during March-May peak spawning for black sea bass would be expected under **Alternatives 3 (Preferred)**, **4,** and **6**. **Alternative 5** could allow fishing to occur during the May portion of peak spawning. **Alternative 10** would be expected to result in early closures when applied to **Alternatives 3 (Preferred)-6**. Closures during March-May peak spawning for black sea bass would be expected under **Alternative 3 (Preferred)** and **Alternative 4**. **Alternatives 5** and **6** could allow fishing to occur during the May and March portions of peak spawning, respectively.

Alternative 11 would close the pot fishery when 90% of the commercial quota is met and allow other gear types to be used until the quota is met. Historically, approximately 90% of the black sea bass harvest has been taken with pots. Landings on trips where hook and line gear is used is very small **(Table 4-1)**. Fishermen are able to target black sea bass with pots; however, black sea bass are more likely incidental catch when fishermen use hook and line gear to target co-occurring species. Therefore, **Alternative 11** would be expected to reduce bycatch mortality of black sea bass to some degree by allowing a small harvest of black sea bass after the majority of the quota has been harvested with pot gear.

Peak spawning has been reported to occur during March-May and February-April in the South Atlantic. However, there is evidence 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. Therefore, sub-alternatives with earlier seasonal closures (i.e., **Sub-Alternative 12a**) would have a greater benefit to black sea bass off the more southern states of Florida and Georgia; whereas, alternatives with a later seasonal closure (i.e., **Sub-Alternatives 12b and 12d)** would have a greater biological benefit to black sea bass off North Carolina. **Sub-Alternative 12a** would encompass a larger portion of the March-May peak spawning season for black sea bass than **Sub-Alternatives 12b** and **12c**. March and April accounted for 16% of black sea bass landings during the 2005-2009 fishing year. **Sub-Alternative 12b**, would not have as great a biological benefit as **Sub-Alternative 12a** because it would not include the month of March when a large proportion of the population is in spawning condition. April and May accounted for 18% of the total landings during the 2005-2009 fishing year but only 10% of the commercial sector occurred during those months. The biological benefit of **Sub-Alternative 12c** would be greatest of all the alternatives considered because it would encompass the entire March-May period of peak spawning. The biological benefit of **Sub-Alternative 12d** would be least among the action alternatives because it would only close May when a small proportion of the population is in spawning condition relative to March and April. The biological benefit to black sea bass, the order of sub-alternatives from greatest benefit to least is: **Sub-Alternative 12c; Sub-Alternative 12a; Sub-Alternative 12b;** and **Sub-Alternative 12d**.

Alternative 13 and its sub-alternatives would reduce the recreational bag limit to a level that would prolong the black sea bass recreational fishing season. The intent of **Alternative 13** is to increase the social and economic benefits associated with extending the season. Adjusting the bag limit would not be expected to have negative biological effects on the stock. Biological protection for the black sea bass stock is provided by the ACL. Based on data from the June 2010-May 2011 fishing year, the 5 fish per person bag limit specified in **Sub-Alternative 13b (Preferred)** would be expected to extend the fishing year through March.

With regard to short-term economic impacts among **Sub-Alternatives 2a-2h**, **Sub-Alternative 2h** (340 pounds gw trip limit) has the largest short-term negative economic effects in the form of foregone dockside revenues while **Sub-Alternative 2a** has the second largest negative effect. **Sub-Alternatives 2b, 2e, 2c, 2d, 2f,** and **2g** have the next largest economic losses in descending order. In general, the smaller the trip limit, the larger the economic losses. However, smaller trip limits could have some economic benefit in that fish houses and dealers would possibly be able to maintain some supply for a longer period of season and could possibly receive higher prices for their product since the market would not be flooded with an excess of black sea bass over a short period of time.

With regard to **Alternatives 3 (Preferred)-6**, **Alternative 6** is preferable to the other alternatives followed by **Alternative 5**, **Alternative 3 (Preferred)**, and **Alternative 4** based on the number of weeks fishermen are expected to be able to fish. The early closures during the early part of the calendar year would result in long-term economic benefits in that the spawning season would be protected. The change in the fishing year under **Alternatives 5** and **6** for the recreational fishery would result in a longer season than if there was no change in the start of the fishing year (**Alternatives 1, 3 (Preferred),** and **4**). This indicates that **Alternatives 5** and **6** would result in short-term economic benefits to the recreational fishery but a decrease in long-term economic benefits due to a decrease in biological benefits under **Alternatives 5** and **6**. **Alternatives 7 (Preferred)** and **8** would be economically beneficial to fishermen in the short-term. However, if this results in overfishing or interruption of the rebuilding plan, then long-term economic benefits would be negative.

Alternatives 3 (Preferred), 4, and **6** would have long-term economic benefits in that the fishing would be closed during peak spawning periods. With regards to short-term economic benefits, **Alternative 9** in combination with **Alternative 4** appears to allow for 20 additional fishing days compared to **Alternative 3 (Preferred)**. In general, black sea bass pot users would be disadvantaged by **Alternatives 9-11** since they decrease fishing opportunities for pot gear users compared to **Alternative 1 (No Action)**. However, these alternatives benefit hook and line users. Although, it is mentioned above that black sea bass appears to be an incidental catch for hook and line users. **Alternative 10** is economically preferable to **Alternative 9** for pot users given that pot users can land more black sea bass under **Alternative 10**. **Alternative 11** seems economically preferable to pot users than both **Alternative 9** and **10** since it allows access to greater amounts of commercial quota.

Sub-Alternative 12c results in the largest loss in dockside revenues while **Sub-Alternative 12d** results in the smallest loss. While **Sub-Alternative 12a and 12b** spawning season closures are the same approximate length, **Sub-Alternative 12a** has the larger loss associated with it due to the relatively large amount of black sea bass harvested in March compared to May. With regard to the recreational fishery, **Sub-Alternative 12c** is expected to result in the largest short-term economic losses followed by **Sub-Alternatives 12b, 12a, and 12d** in descending order. In general, implementation of a spawning season closure will result in long-term economic benefits for commercial and recreational fisheries with **Sub-Alternative 12c** having the greatest long-term economic benefit and **Sub-Alternative 12d** the smallest.

Under **Alternative 13** and its sub-alternatives, a longer open season would be expected to result in more trips and increased economic benefits. However, a bag limit reduction, implemented to extend the season, would be expected to result in lower economic benefits per day or per trip because of the potential reduced quality of the fishing trip. Depending on the bag limit, the resulting reduction in benefits associated with the lower quality trips could be less than, equal to, or more than the increase in benefits associated with the increased number of trips (or the trips that were cancelled as a result of the original closure). As a result, the primary economic issue is whether the increase in benefits associated with more trips is greater than, or at least equal to, the reduction in benefits associated with lower quality trips (for all trips, including those that are "recovered" as a result of the shortened closure).

Based on information from **Table 4-12a** (Biological Effects), a 15-fish bag limit would not be expected to reduce harvests of black sea bass. A 7-fish bag limit (**Sub-Alternative 13a**) would be expected to reduce headboat harvest by 8%, charter harvest by 13% and private mode harvest by 5%. A 5-fish bag limit (**Sub-Alternative 13b (Preferred)**) would be expected to reduce headboat harvest by 14%, charter harvest by 20%, and private mode harvest by 5%. A 3-fish bag limit (**Sub-Alternative 13c**) would be expected to reduce headboat harvest by 25%, charter harvest by 35%, and private mode harvest by 23%. A 2-fish bag limit (**Sub-Alternative 13d**) would be expected to reduce headboat harvest by 34%, charter harvest by 49%, and private mode harvest by 35%. A 1-fish bag limit (**Sub-Alternative 13e**) would be expected to reduce headboat harvest by 51%, charter harvest by 69%, and private mode harvest by 56%. It is assumed that reductions for the shore mode would follow the average reduction for all sectors: 6% under a 7-fish bag limit (**Sub-Alternative 13a**) , 12% under a 5-fish bag limit (**Sub-Alternative 13b (Preferred)**), 25% under a 3-fish bag limit (**Sub-Alternative 13c**), 37% under a 2-fish bag limit (**Sub-Alternative 13d**), and 57% under a 1-fish bag limit (**Sub-Alternative 13e**). A summary of the effects of the alternatives is shown in **Table 2-1**.

Table 2-1. Comparison of effects of trip limits, split seasons, spawning season closures, and bag limit reductions for black sea bass.

Alternatives	Biological Effects	Socioeconomic/Administrative Effects
Alternative 1 (No Action)	(+-) there would be no biological effect other than the continued rebuilding of the stock because the fishery would still close when the quota is met, it would just be met sooner and sooner each year. The earlier the ACL is met the more likely the spawning stock would be protected during spawning season in March-May.	(+-) Positive short-term socioeconomic effects expected. Negative long-term economic effects could occur.
Alternative 2 Commercial trip limit for BSB	(+-) Because the fishery is managed through a quota, and the quota would remain the same there would be no significant biological impact. However, under larger bag limits the fishery is more likely to reach the ACL before peak spawning season, which could help protect the spawning stock.	(+-) Negative short-term socioeconomic effects expected. Short-term economic losses estimated to total between $1,000 and $499,000. Positive long-term economic effects could occur as a result of trip limits. An increase in number of trips and derby fishery could occur. Some vessels expected to stop fishing due to lack of profitability under some trip limits.
Alternative 3 (Preferred) Separate commercial ACLs for June-November and December-May based on landings from 2006-2009	(+-) Overall there would not be a significant biological impact since fishing would end when the split season ACL is met. However, there is a greater likelihood that fishing would take place during spawning season if the Dec.-May ACL is not met early.	(+-) Could have positive short-term socioeconomic effects but Alternatives 6 and 5 are preferable. Negative long-term socioeconomic effects could occur if fishing occurs during spawning season.
Alternative 4 Separate commercial ACLs for June-December and January-May based on landings from 2006-2009.	(+-) Overall there would not be a significant biological impact since fishing would end when the split season ACL is met. However, there is a greater likelihood that fishing would take place during spawning season if the Jan.-May ACL is not met early.	(+-) Could have positive short-term socioeconomic effects but Alternatives 6, 5 and 3 are preferable. Negative long-term socioeconomic effects could occur if fishing occurs during spawning season.

Alternatives	Biological Effects	Socioeconomic/Administrative Effects
Alternative 5 November-October fishing year and separate commercial ACLs for November-April 30 and May 1-October based on landings from 2006-2009.	(+-) Overall there would not be a significant biological impact since fishing would end when the split season ACL is met. However, there is a greater likelihood that fishing would take place during spawning season.	(+-) Positive short-term socioeconomic effects expected due to longer recreational fishing season. Negative long-term socioeconomic effects could occur due to possible fishing during spawning season.
Alternative 6 January-December fishing year and separate commercial ACLs for January-June and July-December based on landings from 2006-2009.	(+-) Overall there would not be a significant biological impact since fishing would end when the split season ACL is met. However, there is a greater likelihood that fishing would take place during spawning season if the Jan.-June ACL is not met early.	(+-) Positive short-term socioeconomic effects expected due to longer recreational fishing season. Negative long-term socioeconomic effects could occur due to possible fishing during spawning season.
Alternative 7 (Preferred) Carry over unused portion of commercial ACL from first part of fishing year to second portion of season.	(+-) Overall there would not be a significant biological impact since fishing would end when the split season ACL is met. However, there is a greater likelihood that fishing would take place during spawning season.	(+-) Positive short-term socioeconomic effects expected. Possible negative long-term socioeconomic effects could occur if fishing took place during spawning season.
Alternative 8 carry over unused portion of commercial ACL from second part of fishing year to next fishing year.	(-) The ACL could be exceeded, and the carry over amount could be large enough to exceed the ABC or OFL.	(+-) Positive short-term socioeconomic effects expected. Negative long-term economic effects could occur if ACL is exceeded.
Alternative 9 Close pot sector when all but 100,000 pounds is harvested, other allowable gear types would be allowed, start second season for the remainder of the quota for all allowable gear types.	(+-) Could result in early closures when applied to Alternatives 3-6, the fishing during the spawning season would cease under Alternatives, 3, 4, and 6. Alternative 6 could allow fishing during the spawning season. Overall there is expected to be no significant biological impact.	(+-) Negative socioeconomic effects expected for pot gear users. Other allowable gear users would benefit.
Alternative 10 Close pot sector when all but 50,000 pounds is harvested, other allowable gear types would be allowed, start second season for the remainder of the quota for all allowable gear types.	(+-) Could result in early closures when applied to Alternatives 3-6, the fishing during the spawning season would cease under Alternatives, 3 and 4. Alternatives 5 and 6 could allow fishing during the spawning season. Overall there is expected to be no significant biological impact.	(+-) Negative socioeconomic effects expected for pot gear users but Alternative 10 is preferable to 9. Other allowable gear users would benefit.
Alternative 11 Close pot fishery when 90% of the commercial ACL is met.	(+) May reduce bycatch mortality by allowing some small amount of harvest after the ACL has been met for pot gear.	(+-) Possible negative socioeconomic effects expected for pot gear users. Positive long-term socioeconomic effects could occur due to biological benefits.

Alternatives	Biological Effects	Socioeconomic/Administrative Effects
Alternative 12 Spawning season closure for black sea bass.	(+) Alternatives that encompass the March-May spawning season would be most beneficial.	(+-) Negative short-term socioeconomic effects expected. Positive long-term socioeconomic effects could occur with Alternative 12c having greatest long-term socioeconomic benefits.
Alternative 13b (Preferred) Modification in bag limit	(+-) Not be expected to have negative biological effects on the stock. Biological protection for the black sea bass stock is provided by the ACL.	(+-) Benefits of lengthening the fishing season may be equal to, less than, or more than the negative effect of reduced quality of trips, or the cost of more trips taken to compensate under a reduced bag limit.

(-) overall negative impacts, (+) overall positive impacts, (- +) neutral impacts

Action 2. <u>Trip Limits for Vermilion Snapper</u>

Alternative 1 (No Action). Commercial ACL (quota) 618, 046 pounds gw (686,031 pounds ww) which is split into two ACLs (quotas), 315,523 pounds gw (350,231 pounds ww) during January-June and 302,523 pounds gw (335,800 pounds ww) during July-December. There is no commercial trip limit.

Alternative 2. Establish a 1,000 pounds gw (1,110 pounds ww) commercial trip limit.

> **Sub-Alternative 2a.** Establish a 1,000 pounds gw (1,110 pounds ww) commercial trip limit and reduce to 500 pounds gw (555 pounds ww) when 75% of the ACL (quota) is met or projected to be met.

Alternative 3 (Preferred). Establish a 1,500 pounds gw (1,665 pounds ww) commercial trip limit.

> **Sub-Alternative 3a.** Reduce the trip limit to 500 pounds gw when 75% of the commercial ACL (quota) is met or projected to be met.

Alternative 4. Establish a 750 pounds gw (833 pounds ww) trip limit.

> **Sub-Alternative 4a.** Establish a 750 pounds gw (833 pounds ww) commercial trip limit and reduce to 400 pounds gw (444 pounds ww) when 75% of the commercial ACL (quota) is met or projected to be met.

Alternative 5. Establish a 500 pounds gw (555 pounds ww) commercial trip limit.

Alternative 6. Establish a 400 pounds gw (444 pounds ww) commercial trip limit.

Comparison of Alternatives

Alternative 1 (No Action) would not implement any regulations to slow down the rate at which the quota is being met for vermilion snapper and provide no relief to derby conditions that may be occurring. **Alternative 1 (No Action)** could have positive biological effects if effort is reduced for long periods of time including a portion of the time of peak spawning, which occurs during June-August. However, **Alternative 1 (No Action)** could also have negative biological effects when fishermen target co-occurring species and discard dead vermilion snapper. **Alternative 2** could be expected to extend the fishing season by about three weeks for both July-December and January-June. Reducing the trip limit from 1,000 pounds gutted weight to 500 pounds gutted weight during July-December 2009 and January-June 2010 (**Sub-Alternative 2a**) would extend the fishing season by approximately two additional weeks. **Alternative 3 (Preferred)** could be expected to extend the fishing season by about one to two weeks during July-December and January-June. Establishing a 1,500 pounds gutted weight trip limit that would be reduced to 500 pounds gutted weight when 75% of the quota is met (**Sub-Alternative 3a**) could extend the season by about a month during July-December and 3 weeks during January-June.

Alternative 4 would be expected to extend the fishing season by about five weeks during the July-December 2009 and January-June 2010 fishing years. Reducing the trip limit to 400 pounds gutted weight when 75% of the quota is met (**Sub-Alternative 4a**) would be expected to extend the fishing season by about two additional weeks. **Alternative 5** (500 pounds gutted weight trip limit) would be expected to extend the June-December 2009 fishing season through November; whereas during January-June, this trip limit might keep the season open through the end of May due to a lower number of trips and a greater percentage of trips being constrained by the trip limit. Under **Alternative 6**, the quota would likely have been met in December for the June-December 2009 fishing and June during January-June 2010. Overall, a trip limit between 400 and 500 pounds gutted weight would be needed to keep the fishery open for the whole fishing season.

In general, as trip limits decrease, revenue losses increase. Revenue losses are highest for **Alternative 6** (400 pound trip limit) and lowest for **Alternative 3** (**Preferred)**; 1,500 pound trip limit). The next highest revenue losses are under **Alternative 5, Sub-Alternative 4a, Alternative 4, Sub-Alternative 2a, Alternative 2, Sub-Alternative 3a**, and **Alternative 3 (Preferred)**. However, trip limits can result in a longer season which could increase ex-vessel prices and ultimately result in higher profits for some fishermen, and perhaps the fishery overall. However, we are not able to estimate this at this time. This analysis simply estimates revenue losses if fishermen behavior and market prices do not change, however unrealistic that may be.

Low vermilion trip limits (**Alternative 6**) will impact North Carolina and Georgia and Northeast Florida the most with some effects felt in South Carolina. The remainder of the alternatives would result in larger revenue losses in Georgia and Northeast Florida than North Carolina, although the differences are relatively small. A summary of the effects of the alternatives is shown in **Table 2-2**.

Table 2-2. Comparison of effects of trip limits on vermilion snapper.

Alternatives	Biological Effects	Socioeconomic/Administrative Effects
Alternative 1 (No Action)	(+-) Overall no significant biological impact is expected. Could reduce effort for long periods of time, but could also lead to increased dead discards when fishermen target co-occurring species during the quota closure.	(+-) Positive short-term socioeconomic effects expected but negative long-term economic effects could occur.
Alternative 2 1,000 pounds gw commercial trip limit	(+-) Because vermilion is managed under a split season ACL already, there is no significant biological benefit expected from trip limits because the ACLs remain the same regardless of the trip limit.	(+-) $611,000 and $752,000 in short-term commercial revenue losses expected for Alternatives 2 and 2a, respectively. Long-term socioeconomic benefits could be positive.
Alternative 3 (Preferred)/3a 1,500 pounds gw commercial trip limit	(+-) Because vermilion is managed under a split season ACL already, there is no significant biological benefit expected from trip limits because the overall harvest would remain the same regardless of the trip limit.	(+-) $306,000 and $505,000 in short-term commercial revenue losses expected for Alternatives 3 and 3a, respectively. Long-term socioeconomic benefits could be positive.

Alternatives	Biological Effects	Socioeconomic/Administrative Effects
Alternatives 4/4a. 750 pounds gw trip limit/reduce to 400 pounds gw when 75% of the ACL is met	(+-) There is no significant biological benefit expected from trip limits, however, this alternative may hedge against an ACL overage by slowing the pace of harvest when the ACL is close to being caught.	(+-) $880,000 and $1,013,000 in short-term commercial revenue losses expected for Alternatives 4 and 4a, respectively. Long-term socioeconomic benefits could be positive.
Alternative 5 500 pounds gw commercial trip limit	(+-) Because vermilion is managed under a split season ACL already, there is no significant biological benefit expected from trip limits because the overall harvest would remain the same regardless of the trip limit.	(+-) $1,302,000 in short-term commercial revenue losses expected for Alternative 5. Long-term socioeconomic benefits could be positive.
Alternative 6 400 pounds gw commercial trip limit	(+-) Because vermilion is managed under a split season ACL already, there is no significant biological benefit expected from trip limits because the overall harvest would remain the same regardless of the trip limit.	(+-) $1,528,000 in short-term commercial revenue losses expected for Alternative 6. Long-term socioeconomic benefits could be positive.

(-) overall negative impacts, (+) overall positive impacts, (- +) neutral impacts

Action 3. Trip Limits for Gag

Alternative 1 (No Action). ACL (quota) is 352,940 pounds gw. Seasonal closure occurs during January-April. There is no trip limit.

Alternative 2 (Preferred). Establish a 1,000 pounds gw (1,180 pounds ww) trip limit.

Sub-Alternative 2a. Establish a 1,000 pounds gw (1,180 pounds ww) trip limit and reduce to 100 pounds gw (118 pounds ww) when 75% of the commercial ACL (quota) is met or projected to be met.

Alternative 3. Establish a 750 pounds gw (885 pounds ww) trip limit.

Sub-Alternative 3a. Establish a 750 pounds gw (885 pounds ww) trip limit and reduce to 100 pounds gw (118 pounds ww) when 75% of the commercial ACL (quota) is met or projected to be met.

Alternative 4. Establish a 1,000 pounds gw (or the appropriate head count) trip limit with a season starting on May 1 and reduce the trip limit to 100 pounds gw (118 pounds ww) when 90% of the ACL (quota) is met or projected to be met.

Comparison of Alternatives

Alternative 1 (**No Action**) would retain the measures established through Amendment 16 (SAFMC 2009a), which became effective on July 19, 2009. The measures include a 352,940 pounds gutted weight (416,469 pounds whole weight) quota and a January-April spawning season closure. The quota was not met in 2009. If future landings were similar to those in 2007, a 1,000 pounds gutted weight trip limit (**Alternative 2, (Preferred)**) would not keep the season open all year. However, if the 1,000 pounds gutted weight trip limit was reduced to 100 pounds gutted weight (**Sub-Alternative 2a**) when 75% of the quota was met, the quota would come within 30,000 pounds of being met. Under **Alternative 3** (750 pounds gutted weight), the gag fishery would be expected to remain open until the end of December. The biological effects of the alternatives would be least for **Alternative 1 (No Action)** and greatest for **Sub-Alternative 3a**, which would allow for the least amount of harvest. **Alternative 4** would establish a 1,000 pounds gutted weight trip limit that would be reduced to 100 pounds gutted weight when 90% of the quota is met or expected to be met. Based on 2007 conditions, the 90% of the quota would be met in November.

The results indicate that lower trip limits result in greater losses in ex-vessel revenues with **Sub-Alternative 3a** having the greatest negative short-term economic effects followed by **Sub-Alternative 2a**, **Alternative 4**, **Alternative 3**, and **Alternative 2 (Preferred)** based on landings made in previous years. As stated above, the methodologies used do not account for fishermen increasing the number of trips they take in reaction to implementation of a trip limit. Actual changes in profits cannot be estimated at this time due to a lack of cost data for particular species. Therefore, it is not known which of the alternatives ultimately results in a more economically preferable outcome since lower trip limits could result in higher ex-vessel prices.

South Carolina and Georgia and Northeast Florida would be most negatively economically affected by trip limits. While **Alternative 2 (Preferred)** would have an equal impact on South Carolina and Georgia and Northeast Florida, **Sub-Alternatives 2a** and **Sub-Alternative 3a** would have a greater negative effect on South Carolina since the average gag pounds per trip harvested in South Carolina are greater than the average gag pounds harvested per trip in Georgia and Northeast Florida. **Alternative 4** economic effects fall in between **Alternatives 2 (Preferred)** and **Sub-Alternative 2a**. A summary of the effects of the alternatives is shown in **Table 2-3**.

Table 2-3. Comparison of effects of trip limits on gag.

Alternatives	Biological Effects	Socioeconomic/Administrative Effects
Alternative 1 (No Action)	(+-) No significant biological impact is expected; however, no measures would be taken to account for anticipated effort shifts.	(+-) Greatest short-term socioeconomic benefits but smallest long-term socioeconomic benefits.
Alternative 2 (Preferred) 1,000 pounds gw commercial trip limit	(+-) No significant biological impact is expected from the implementation of trip limits because overall harvest would remain the same. However reducing the pace of harvest when the ACL is close to being caught would hedge against an ACL overage. This Alternative is more biologically beneficial than Alternative 4 because there would be less probability the ACL would be exceeded.	(+-) Alternative 2 expected to result in $102,000 in commercial revenue loss (smallest revenue loss comparatively). Alternative 2a expected to result in revenue losses between $204,000-$392,000 in commercial revenue losses. These larger trip limits could have long-term negative effects.

Alternatives	Biological Effects	Socioeconomic/Administrative Effects
Alternatives 3/3a 750 pounds gw commercial trip limit	(+-) No significant biological impact is expected from the implementation of trip limits because overall harvest would remain the same. However reducing the pace of harvest when the ACL is close to being caught would hedge against an ACL overage.	(+-) Alternative 3a has the greatest short-term negative socioeconomic effects (between $228,000 and $467,000 in revenue losses). May have largest long-term socioeconomic benefits.
Alternative 4 1,000 trip limit starting in may and reduced to 100 pounds when 90% of ACL is met	(+-) No significant biological impact is expected from the implementation of trip limits because overall harvest would remain the same. However reducing the pace of harvest when the ACL is close to being caught would hedge against an ACL overage. This alternative is less biologically beneficial than Alternative 2 (Preferred) since there would be less of a time buffer to prevent the ACL from being exceeded.	(+-) Short-term socioeconomic effects expected to be less than Alternative 2a but greater than Alternative 2. Long-term socioeconomic benefits may be less than Alternative 3 and 3a but greater than Alternative 1.

(-) overall negative impacts, (+) overall positive impacts, (- +) neutral impacts

Action 4. <u>Trip Limits for Greater Amberjack</u>

Alternative 1 (No Action). Retain the current commercial regulations for greater amberjack in the South Atlantic (**Table 2-4**).

Table 2-4. Current Commercial Regulations for Greater Amberjack

Commercial ACL	Size Limit	Trip Limit	Fishing Season	Other
1,169,931 pounds gw	36" FL	1,000 pounds gw	Closed April 1-30	No sale in April; purchase and sale prohibited once quota is reached. After quota is met, possession limited to 1/person/day or 1/person/trip, whichever is more restrictive

Alternative 2. Change the commercial trip limit for greater amberjack.

- **Sub-Alternative 2a.** Increase the greater amberjack commercial trip limit to 2,000 pounds gw
- **Sub-Alternative 2b.** Increase the greater amberjack commercial trip limit to 1,500 pounds gw
- **Sub-Alternative 2c (Preferred).** Increase the greater amberjack commercial trip limit to 1,200 pounds gw

Comparison of Alternatives

Alternative 1 (No Action) would retain the commercial regulations in place for greater amberjack including a 36" fork length minimum size limit, a 1,000 pounds gutted weight trip limit, a April 1-30 prohibition on harvest, and a 1,169,931 pound gutted weight quota. SEDAR 15 (2008) indicates the stock is not experiencing overfishing ($F_{2006}/F_{MSY} = 0.531$) and is not overfished ($SSB_{2006}/SSB_{MSY} = 1.096$). Furthermore, the commercial quota has never been met since it was established through Amendment 9 in 1999 (SAFMC 1998a). With increased restrictions on other snapper grouper species through Amendments 13C (SAFMC 2006) and 16 (SAFMC 2009a), there has been an interest in increasing the trip limit for greater amberjack.

Alternative 2 would increase the trip limit for greater amberjack from 1,000 pounds gutted weight to 2,000 pounds gutted weight under **Sub-Alternative 2a**, 1,500 pounds gutted weight under **Sub-Alternative 2b**, and 1,200 pounds gutted weight under **Sub-Alternative 2c**. During the 2008 fishing year (May 2008 - April 2009) the estimated landings of greater amberjack from logbook data was 730,854 pounds gutted weight. Based on data from the 2008 fishing year, the commercial quota of 1,169,931 pounds gutted weight quota would not be reached with either the 2,000 pounds trip limit proposed under **Sub-Alternative 2a**, the 1,500 pounds trip limit proposed under **Sub-Alternative 2b**, or the 1,200 pounds trip limit under **Sub-Alternative 2c (Preferred) (Table 2-5)**.

Effort could increase on greater amberjack due to restrictions proposed in Amendments 17A (SAFMC 2010a) and 17B (SAFMC 2010b). This could result in the quota being met before the fishing year is completed. Since SEDAR 15 (2008) indicates release mortality rate of greater amberjack is low (20%), high mortality of greater amberjack after a quota was met would not be likely.

Table 2-5. Estimated landings of greater amberjack expected from increased trip limit. Based on data from May 2008-April 2009 from NMFS Logbook.

trip limit (gutted weight)	Whole weight	Gutted weight
Alternative 1 No Action - 1,000 pounds	760,089	730,854
Sub-Alternative 2a - 2,000 pounds	927,529	891,854
Sub-Alternative 2b - 1,500 pounds	843,809	811,354
Sub-Alternative 2c (Preferred) – 1,200 pounds	**793,577**	**763,054**

Among the proposed alternatives, **Alternative 1 (No Action)** would have the greatest positive biological effect since it would not result in an increased harvest of greater amberjack. **Sub-Alternative 2a**, which would allow for the largest increase in the trip limit would have the greatest negative biological effect on the species. However, the recent assessment indicates the stock is not overfished and is not experiencing overfishing. Based on data from the 2008 fishing year, increasing the trip limit to 2,000 pounds gutted weight would result in landings that are approximately 280,000 pounds less than the quota. Furthermore, incidental mortality of greater amberjack would be expected to be low if the quota was met due to low a low release mortality rate. The biological effect of **Sub-Alternative 2b** and **Sub-Alternative 2c (Preferred)** would be intermediate between **Alternative 1 (No Action)** and **Sub-Alternative 2a**. Therefore, none of the alternatives are expected to have negative biological effects on the stock of greater amberjack.

The results indicate that the larger trip limit (**Sub-Alternative 2a**) results in the largest short-term economic benefit, based on this analysis. **Alternative 1 (No Action)** however, likely results in the highest long-term economic benefits since it restricts fishing to the lowest level compared to **Sub-Alternatives 2a**, **2b,** and **2c (Preferred)**. A summary of the effects of the alternatives is shown in **Table 2-6**.

Table 2-6. Comparison of effects of trip limits on greater amberjack.

Alternatives	Biological Effects	Socioeconomic/Administrative Effects
Alternative 1 (No Action)	(+-) No significant biological impact is expected; however, no measures would be taken to account for anticipated effort shifts.	(+-) Highest long-term economic benefits and smallest short-term economic benefits expected.
Alternatives 2a, 2b, 2c (Preferred) Change the commercial trip limit for greater amberjack, 2,000 pounds, 1,500 pounds or 1,200 pounds	(+-) Because the ACL was never met under the current trip limit, increasing the trip limit could potentially lead to overall increased catch. However, analysis shows that the ACL would still not be met under trip limits of 2,000, 1,500 pounds, or 1,200 pounds	(+-) A trip limit of 2,000 pounds (Sub-Alternative 2a) would provide the largest short-term socioeconomic benefits ($7,000 loss in revenue) and smallest long-term socioeconomic benefits. Sub-Alternative 2b (1,500 pounds trip limit) would produce short-term socioeconomic benefits greater than Alternative 1 but smaller than Sub-Alternative 2a ($12,000 loss in revenue). Long-term socioeconomic benefits would be smaller than Alternative 1 but larger than Sub-Alternative 2a. Alternative 2c would provide the smallest short-term benefit, but would also prevent early instability in market prices that could otherwise result from increased harvest.

(-) overall negative impacts, (+) overall positive impacts, (- +) neutral impacts

3.0 Affected Environment

3.1 Habitat

3.1.1 Inshore/Estuarine Habitat

Many deepwater 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 diurnal feeding migrations or seasonal shifts in cross-shelf distributions. More detail on these habitat types is found in Volume II of the Council's Fishery Ecosystem Plan (SAFMC 2009b).

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

The exact extent and distribution of productive snapper grouper habitat on the continental shelf north of Cape Canaveral 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 feet), 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, the continental shelf narrows from 56 to 16 kilometers (35 to 10 miles) wide, thence reducing 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 feet). Ledge systems formed by rock outcrops and piles of irregularly sized boulders are also common. Parker *et al*. (1983) estimated that 24% (9,443 km^2) of the area between the 27- and 101-meter

(89 and 331 feet) depth contours from Cape Hatteras, NC to Cape Canaveral, FL is reef habitat. Although the benthic (bottom) communities found in water depths between 100 and 300 meters (328 and 984 feet) from Cape Hatteras, NC to Key West, FL 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 unvegetated areas of little or no relief.

The distribution of coral and live hard-bottom habitat as presented in the 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 included in Appendix E of the Habitat Plan (SAFMC 1998b). These maps are also available on the Internet at the Council's following Internet Mapping System website: http://ocean.floridamarine.org/efh_coral/ims/viewer.htm.

Plots of the spatial distribution of offshore species were generated from the Marine Resources Monitoring, Assessment and Prediction (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 mentioned above 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 be generated through the Council's Internet Mapping System at the following web address: http://ocean.floridamarine.org/efh_coral/ims/viewer.htm.

3.1.3 Essential Fish Habitat

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

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

3.1.4 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; and Council-designated Artificial Reef Special Management Zones (SMZs). Areas that meet the criteria for designating essential fish habitat-habitat areas of particular concern include habitats required during each life stage (including egg, larval, postlarval, juvenile, and adult stages).

In addition to protecting habitat from fishing related degradation though FMP regulations, the Council, in cooperation with NOAA Fisheries Service, actively comments on non-fishing projects or policies that may impact essential fish habitat. With guidance from the Habitat Advisory Panel, the Council has developed and approved habitat 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 nearshore flows, offshore aquaculture, marine invasive species and estuarine invasive species. The policies are available on the Council's website at www.safmc.net.

3.2 Biological/Ecological Environment

3.2.1 Species Most Impacted By This FMP Amendment

3.2.1 Gag, *Mycteroperca microlepis*

Gag 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 meters (131-498 feet) (Heemstra and Randall 1993) and prefer inshore-reef and shelf-break habitats (Hood and Schleider 1992). Bullock and Smith (1991) indicated 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 kilometers (100 nautical miles). Most of these individuals were tagged off South Carolina and were recaptured off Georgia, Florida, and in the Gulf of Mexico.

Gag are probably 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 millimeters (0.5 inches) Total Length (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 meters (16-49 feet) above the reef (Bullock and Smith 1991) and as far as 40-70 kilometers (22-38 nautical miles) offshore.

Huntsman *et al.* (1999) indicated 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 0.14 (SEDAR 10 2006). Maximum reported size for gag is 145 centimeters (57.5 inches) TL and 36.5 kilograms (81 pounds) (Heemstra and Randall 1993), and maximum reported age is 26 years (Harris and Collins 2000). Gag is a sequential hermaphrodites, changing sex from female to male with increased size and age (Coleman *et al.* 1996; McGovern *et al.* 1998; Coleman *et al.* 2000). All individuals less than 87.5 centimeters (34.7 inches) TL are females. At 105.0 centimeters (41.6 inches) TL, 50% of fishes are males. Almost all gag are males at sizes greater than 120.0 centimeters (47.5 inches) TL (McGovern *et al.* 1998).

Along the southeastern United States (1994-1995), size at first maturity is 50.8 centimeters (20.2 inches) TL, and 50% of gag females are sexually mature at 62.2 centimeters (24.7 inches) (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 collected during 1978-1982 off the southeastern United States, McGovern *et al.* (1998) reported the smallest mature females were 58.0 centimeters (22.9 inches) TL and 3 years old. Hood and Schleider (1992) indicated 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 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, and can occur in groups of 5 to 50 individuals. They feed primarily on fishes, crabs, shrimp, 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 millimeters (1 inch) in length (Bullock and Smith 1991; Mullaney 1994).

3.2.2 Vermilion Snapper, *Rhomboplites aurorubens*

Vermilion snapper occur in the Western Atlantic, from North Carolina to Rio de Janeiro. It 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-SAR 2 2003a).

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.* 1998). SEDAR 2-SAR2 (2003a) recommends that natural mortality (M) be defined as 0.25/year, with a range of 0.2-0.3/year. 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 20.0 centimeters (7.9 inches) (SEDAR 2-SAR 2 2003a). 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) FL and the smallest male was 17.9 centimeters (7.1 inches) FL (Cuellar *et al.* 1996). Zhao and McGovern (1997) reported that 100% of males that were collected after 1982 along the southeastern United States were mature at 14.0 centimeters (5.6 inches) TL and age 1. All females collected after 1988 were mature at 18.0 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.

3.2.3 Black Sea Bass, *Centropristis striata*

Black sea bass occur in the Western Atlantic, from Maine to southeastern Florida, and in the eastern Gulf of Mexico (McGovern *et al.* 2002; **Table 3-1**). Separate populations were reported to exist to the north and south of Cape Hatteras, North Carolina (Wenner *et al.* 1986). However, genetic similarities suggest 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 meters (7-394 feet). Most adults occur at depths from 20-60 meters (66-197 feet) (Vaughan *et al.* 1995). Black sea bass north of the Virginia/North Carolina border are currently managed as part of the Fishery Management Plan for Summer Flounder, Scup, and Black Sea Bass and are managed by the Mid-Atlantic Fishery Management Council. Black sea bass occurring south of the Virginia/North Carolina boarder are managed by the South Atlantic Fishery Management Council under the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region.

Maximum reported size is 66 centimeters (26.1 inches) total length and 3.6 kilograms (7.9 pounds) (McGovern *et al.* 2002). Maximum reported age is 10 years (McGovern *et al.* 2002); however, ages as great as 20 years have been recorded in the Mid Atlantic region (Lavenda 1949; Froese and Pauly 2003). Natural mortality is estimated to be 0.30 (SEDAR 2 2003b). The minimum size and age of maturity for females reported off the southeastern U.S. coast is 10 centimeters (3.6 inches) standard length and age 0. All females are mature by 18.0 centimeters (7.1 inches) standard length and age 3 (McGovern *et al.* 2002; Wenner *et al.* 1986)) report peak spawning occurs from March through May in the South Atlantic Bight. McGovern *et al.* (2002) indicate 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. Black sea bass change sex from female to male (protogyny). Females dominate the first 5 year classes and individuals over the age of 5 are more commonly males. The size at maturity and the size at transition of black sea bass was smaller in the 1990s than during the early 1980s off the southeast U.S. Black sea bass appear to compensate for the loss of larger males by changing sex at smaller sizes and younger ages (McGovern *et al.* 2002).

The diet of black sea bass is generally composed of shrimp, crab, and fish (Sedberry 1988). Smaller black sea bass eat small crustaceans and larger individuals feed on decapods and fishes.

3.2.4 Greater Amberjack, *Seriola dumerili*

The greater amberjack 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). The greater amberjack is found at depths of 18-360 meters (60-1,181 feet). It inhabits 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 pounds) (Paxton *et al.* 1989). Size at maturity and age at 50% maturity for females is estimated as 73.3 centimeters (28.9.3 inches) 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).

3.3 Science Underlying the Management of Snapper Grouper Species Most Impacted By This FMP Amendment

The status of gag, vermilion snapper, black sea bass, and greater amberjack has been recently assessed through the Southeast Data, Assessment, and Review (SEDAR) process.
The SEDAR process consists of a series of workshops aimed at ensuring that each assessment is based on the best available scientific information. First, representatives from NOAA Fisheries Service, state agencies, and the South Atlantic Council, as well as experts from non-governmental organizations and academia, participate in a data workshop. The purpose of a data workshop is to assemble and review available fishery-dependent and fishery-independent data and information on a stock, and to develop consensus about what constitutes the best available scientific information on the stock, how that information should be used in an assessment, and what type of stock assessment model should be employed.

Second, assessment biologists from these agencies and organizations participate in a stock assessment workshop, where data from the data workshop are input into one or more stock assessment models (e.g., production, age-structured, length structured, etc.) to generate estimates of stock status and fishery status. Generally, base runs and a number of additional runs to examine sensitivity of results to various assumptions (e.g., different natural mortality rates, different data sets/catch periods, etc.).

Finally, a stock assessment review workshop is convened to provide representatives from the Center for Independent Experts (CIE) the opportunity to peer review the results of the stock assessment workshop. Representatives from NOAA Fisheries Service, the South Atlantic Council, and constituent groups may attend and observe the review but the actual review is conducted by the CIE. The Council's Scientific and Statistical Committee (SSC) then reviews the report of the stock assessment review workshop.

The review portion of the SEDAR process has helped improve the acceptance of stock assessments. However, continued lack of basic fishery data has resulted in uncertainty in the assessment results. Each SEDAR Review Panel has identified significant shortcomings in data and research. In addition, not all of the reviews have been completed with 100% consensus.

3.3.1 Gag assessment and stock status

SEDAR assessment

The stock of gag off the United States South Atlantic was assessed during a SEDAR assessment workshop, held at the Wyndham Grand Bay Hotel, Miami, Florida, on May 1–5, 2006. The workshop's objectives were to complete the SEDAR 10 benchmark assessment of gag and to conduct stock projections. Participants in the benchmark assessment included state, Federal, and university scientists, as well as Council members and staff, and various observers. All decisions regarding stock assessment methods and acceptable data were made by consensus (SEDAR 10 2006).

Available data on the stock included abundance indices, recorded landings, and samples of annual size compositions and age compositions from fishery-dependent sources. Three fishery-dependent abundance indices were developed by the data workshop: one from the NOAA Fisheries Service headboat survey, one from the commercial logbook program, and one from the Marine Recreational Fisheries Statistical Survey (MRFSS). There were no usable fishery–independent abundance data for this stock of gag. Landings data were available from all recreational and commercial fisheries. The assessment included data through 2004.

A forward projecting statistical model of catch at age was used as the primary assessment model. In addition, an age-aggregated production model was used to investigate results under a different set of model assumptions. The assessment workshop developed two base runs: one assuming a time-varying catchability and one assuming constant catchability for the fishery-dependent indices. Each base run of the catch-at-age model was used for estimation of benchmarks and stock status.

Stock projections were evaluated under five scenarios starting in 2008. Each scenario applied the current fishing mortality rate (F) in years 2005-2007. Starting in 2008, the five projection scenarios included: 1) Current F; 2) F_{MSY}; 3) 85% of F_{MSY}; 4) 75% of F_{MSY}; and 5) 65% of F_{MSY}.

Status

The gag stock in the Atlantic was undergoing **overfishing** as of 2004 (last year of data in the stock assessment). This means fish are being removed more quickly than the stock can replace them such that the maximum sustainable yield (MSY) cannot be achieved. The Council compares the current fishing mortality rate (F) to the level of fishing mortality that would result in overfishing (maximum fishing mortality threshold or MFMT) and if the current F is greater than the MFMT, overfishing is occurring. For gag the most recent estimate of the fishing mortality rate (F) is from 2004 and is = 0.310. The Council is using the fishing mortality rate that would produce the maximum sustainable yield (F_{MSY} = 0.237) as the maximum fishing mortality threshold. Comparing these two numbers:

- F_{2004}/MFMT = 0.310/0.237 = 1.309

This comparison is referred to as the overfishing ratio. If the ratio is greater than 1, then overfishing is occurring.

The gag stock in the Atlantic was not overfished as of the start of 2005. This means that the spawning stock biomass (pounds of spawning fish in the water) has not been reduced below the level that could produce the maximum sustainable yield. The Council compares the current spawning stock biomass (SSB) to the level of spawning stock biomass that could be rebuilt to the level to produce the MSY in 10 years. This is referred to as the minimum spawning stock biomass or MSST. For gag, the estimated level of spawning stock biomass in 2005 was 7,470,000 pounds gutted weight (gw). The minimum stock size threshold (MSST) = 6,816,000 pounds gw. Comparing these two numbers:

- SSB_{2005}/MSST = 7,470,000/6,816,000 = 1.096

This comparison is referred to as the overfished ratio. If the ratio is less than 1, then the stock is overfished. The Council took measures to end overfishing in Amendment 16 (SAFMC 2009a), which was implemented in July 2009.

3.3.2 Vermilion Snapper assessment and stock status

<u>SEDAR assessment</u>

A SEDAR stock assessment workshop was convened at the NOAA Center for Coastal Fisheries and Habitat Research Beaufort, North Carolina, on Monday, April 4, 2007. The workshop's objectives were to conduct an update assessment of the vermilion snapper off the southeastern U.S. and to conduct stock projections based on possible management scenarios. Participants in the update assessment included state and federal scientists, Council AP and SSC members, and various observers. All decisions regarding stock assessment methods and acceptable data were made by consensus (SEDAR Update #3 2007).

Available data on the species included all those utilized for the benchmark assessment conducted in 2002; no additional data sources were identified during the scoping workshop. These data were abundance indices, recorded landings, and samples of annual size compositions from indices and landings. Four abundance indices were used in the benchmark assessment: one from the NMFS headboat survey and three from the SC MARMAP fishery-independent monitoring program. Landings data were available from all recreational and commercial fisheries. While the MARMAP chevron trap index decreased in recent years, the remaining abundance indices showed neither marked increase nor decline during the assessment period (1976–2006).

The statistical model of catch at length as developed for the benchmark assessment was used as the only assessment model. The assessment workshop provided the base run of the model, identical to that used in the benchmark assessment. This base run was used for the estimation of benchmarks and stock status. The benchmark assessment concluded that the high degree of uncertainty in recruitment and spawning stock biomass estimates meant that reliable biomass based benchmarks could not be developed from the assessment, and this was found to be the case for the update assessment as well.

The ratio of fishing mortality in 2006 to F_{MAX} was 2.05, compared to 1.71 in the benchmark assessment, suggesting that overfishing continues. Projections were used to evaluate the potential of the stock to be rebuilt, but could only be conducted for constant F scenarios. Four projections were considered: $F=F_{MAX}$; $F=85\%F_{MAX}$; $F=75\%F_{MAX}$; and $F=65\%F_{MAX}$. The results of each were very similar.

Recognizing the need for a new benchmark assessment, NOAA Fisheries Service and the state of South Carolina began sampling available vermilion snapper otoliths (ear bones) to enable an age-based assessment. Further, the SEDAR steering committee replaced white grunt in the SEDAR schedule with vermilion snapper. A new age based assessment for vermilion snapper was completed in 2008 (SEDAR 17 2008). Three different model structures were applied: a statistical catch-at-age model; stock reduction analysis; and a surplus production model. In addition, catch curve analysis was used to examine mortality. The primary model was a statistical catch-at-age model implemented with the AD Model Builder software.

Stock Status

The vermilion snapper stock in the Atlantic was **undergoing overfishing** as of 2006 (last year of data in the stock assessment update). This means fish are being removed more quickly than the stock can replace them such that the maximum sustainable yield (MSY) cannot be achieved. The Council compares the current fishing mortality rate (F) to the level of fishing mortality that would result in overfishing (maximum fishing mortality threshold or MFMT) and if the current F is greater than the MFMT, overfishing is occurring. For vermilion snapper the most recent estimate of the fishing mortality rate is from 2006 and was = 0.729. The Council is using the fishing mortality rate that produces the greatest yield per fish ($F_{MAX} = 0.355$) as the maximum fishing mortality threshold. F_{MAX} is being used as a proxy for F_{MSY} (F_{MSY} = Fishing mortality rate that would produce maximum sustainable yield) because the SSC did not have confidence in the calculated biomass reference points. The SSC does have confidence in the fishing mortality rate estimates from the SEDAR assessment. Comparing these two numbers:

- $F_{2006}/MFMT = 0.729/0.355 = 2.05$

This comparison is referred to as the overfishing ratio. If the ratio is greater than 1, then overfishing is occurring.

SEDAR 17 (2008) confirmed that the stock is experiencing overfishing but indicated the stock is **not overfished**. The base run of the catch-at-age model estimated the current stock status to be: $SSB_{2007}/SSB_{MSY} = 0.86$ and $SSB_{2007}/MSST = 1.10$, both indicating the stock is not overfished. It estimated the current fishery status in 2007 to be: $F_{2007}/F_{MSY} = 1.27$, indicating the stock was subject to overfishing in 2007.

3.3.3 Black sea bass assessment and stock status

<u>SEDAR assessment</u>

Black sea bass was assessed at the second SEDAR (SEDAR 2 2003b). Data for the SEDAR assessment were assembled and reviewed at a data workshop held during the week of October 7, 2002 in Charleston, South Carolina. The assessment utilized commercial and recreational landings, as well as abundance indices and life history information from fishery-independent and fishery-dependent sources. Six abundance indices were developed by the data workshop. Two CPUE indices were used from the NMFS headboat survey (1978-2001) and the MRFSS recreational survey (1992-1998). Four indices were derived from CPUE observed by the South Carolina MARMAP fishery-independent monitoring program ("Florida" trap index, 1981-1987; blackfish trap index, 1981-1987; hook and line index, 1981-1987; and chevron trap index, 1990-2001) (SEDAR 2 2003b).

Age-structured and age-aggregated production models were applied to available data at the assessment workshop. The age-structured model was considered the primary model, as recommended by participants in the data workshop. The stock assessment indicated black sea bass was overfished and overfishing was occurring.

At the request of the South Atlantic Council, the SEDAR panel convened to update the 2003 black sea bass stock assessment, using data through 2003, and to conduct stock projections based on possible management scenarios (SEDAR 2 SAR 3 2005). The update indicated the stock was still overfished and overfishing was still occurring but results showed the stock was much more productive that previously indicated. The stock could be rebuilt to the biomass level capable of producing the maximum sustainable yield in 5 years if all fishing mortality were eliminated; previously this was estimated to take 11 years (SEDAR 2 2003b).

<u>Stock Status</u>

The black sea bass stock in the Atlantic is **undergoing overfishing and is overfished** as of 2004 (last year of data in the stock assessment update). For black sea bass the most recent estimate of the fishing mortality rate is from 2003 and was = 2.64 and F_{MSY} = 0.429 as the maximum fishing mortality threshold. Comparing these two numbers:

- F_{2003}/MFMT = 0.729/0.355 = 6.15

This comparison is referred to as the overfishing ratio. If the ratio is greater than 1, then overfishing is occurring.

The black sea bass stock in the Atlantic **is overfished**. For black sea bass, the estimated level of spawning stock biomass in 2005 was 4,099,884 pounds whole weight. The Minimum stock size threshold (MSST) = 10,511,633 pounds whole weight. Comparing these two numbers:

- SSB_{2005}/MSST = 4,099,884/10,511,633 = 0.39

If the ratio is less than 1, then the stock is overfished. An update assessment is scheduled for 2010.

3.3.4 Greater amberjack assessment and stock status

SEDAR assessment

Greater amberjack was assessed at SEDAR 15 (2008). A statistical catch-at-age model and a surplus-projection model were considered in this assessment. A surplus-production model treats all fish in the population as having similar characteristics such as vulnerability to predation or to being caught in the fishery, and similar reproductive capacity. However, in fish populations natural mortality decreases with age, as fish become larger, and fecundity increases with age. A catch-at-age model takes into account the changes in those characteristics with the age of the fish. Because of this enhanced ability to capture demographics, the catch-at-age model was chosen for evaluating stock status and providing management benchmarks and advice. Data used for this assessment consist of records of commercial catch for the handline and commercial dive fisheries, logbook and port sampler data from the recreational headboat fishery, and Marine Recreational Fisheries Statistical Survey data of the rest of the recreational sector. Commercial longline and other landings were included with the hook and line landings for analysis. Greater amberjack were a recreationally-caught species until the late 1980s, when the commercial handline fishery began to target them. Since the early 1990s, landings have been fairly equal between the commercial and recreational sectors. Discards of greater amberjack are relatively low. The estimated time series of fishing mortality rate (F) shows a general increasing trend from the 1980s through the mid-1990s, and then a decline from the 1990s to the present value (around F = 0.23).

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

Stock Status

SEDAR 15 (2008) applies to greater amberjack within US waters of the South Atlantic from Monroe, FL (including the Gulf of Mexico) through Massachusetts. The greater amberjack stock **was not undergoing overfishing and was not overfished** as of 2006 (last year of data in the stock assessment update). For greater amberjack the most recent estimate of the fishing mortality rate is from 2006 and was = 0.225 and F_{MSY} = 0.424 as the maximum fishing mortality threshold. Comparing these two numbers:

- F_{2006}/MFMT = 0.531

This comparison is referred to as the overfishing ratio. If the ratio is greater than 1, then overfishing is occurring.

The greater amberjack stock in the Atlantic is not overfished. For greater amberjack, the estimated level of spawning stock biomass in 2006 was 2,126 metric tons. The minimum stock size threshold (MSST) = 1,455 metric tons. Comparing these two numbers:

- $SSB_{2005}/MSST = 1.461$

If the ratio is less than 1, then the stock is overfished.

3.4 Protected Species

There are 31 different species of marine mammals that may occur in the EEZ of the South Atlantic region. All 31 species are protected under the MMPA and six are also listed as endangered under the ESA (i.e., sperm, sei, fin, blue, humpback, and North Atlantic right whales). Other species protected under the ESA occurring in the South Atlantic include five species of sea turtle (green, hawksbill, Kemp's ridley, leatherback, and loggerhead); the smalltooth sawfish; and two *Acropora* coral species (elkhorn [*Acropora palmata*] and staghorn [*A. cervicornis*]). Designated critical habitat for the *Acropora* corals also occurs within the South Atlantic region. The species potentially affected by the fishery are discussed below.

3.4.1 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 centimeter (8-10 inches) 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 meters (360 feet) (Frick 1976), but they are most frequently making dives of less than 20 meters (65 feet.) (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 centimeters (9-10 inches) 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 centimeters (8 inches) carapace length they move to relatively shallow (less than 50 meters [164 feet]) 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 meters (164 feet) or less (Soma 1985, Byles 1988). Their maximum diving range is unknown. Depending on the life stage a 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 meters (3,280 feet) (Eckert *et al.* 1989) but more frequently dive to depths of 50 to 84 meters (164 - 262 feet) (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 are known to eat a wide range of things including salps, jellyfish, amphipods, crabs, syngnathid fish, squid, and pelagic snails (Brongersma 1972). Stranding records indicate that when pelagic immature loggerheads reach 40-60 centimeters (15-23 inches) 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 to 233 meters (692-764feet.) (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).

3.4.2 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 resources (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).

3.4.3 ESA-Listed Marine Invertebrates

Elkhorn (*Acropora palmata)* and staghorn (*A. cervicornis*) coral were listed as threatened under the ESA on May 9, 2006. The Atlantic *Acropora* Status Review (*Acropora* Biological Review Team 2005) presents a summary of published literature and other currently available scientific information regarding the biology and status of both these species.

Elkhorn and **staghorn** corals are two of the major reef-building corals in the wider Caribbean. In the South Atlantic region, they are found most commonly in the Florida Keys; staghorn coral occurs the furthest north with colonies documented off Palm Beach, Florida (26º3'N). The depth range for these species ranges from <1 meter (3.2 feet) to 60 meters (197 feet). The optimal depth range for elkhorn is considered to be 1 to 5 meters (3.2-16 feet) depth (Goreau and Wells 1967), while staghorn corals are found slightly deeper, 5 to 15 meters (16-49 feet) (Goreau and Goreau 1973).

All Atlantic *Acropora* species (including elkhorn and staghorn coral) are considered to be environmentally sensitive, requiring relatively clear, well-circulated water (Jaap *et al.* 1989). Optimal water temperatures for elkhorn and staghorn coral range from 25° to 29°C (77 to 84° F) (Ghiold and Smith 1990, Williams and Bunkley-Williams 1990). Both species are almost entirely dependent upon sunlight for nourishment, contrasting the massive, boulder-shaped species in the region (Porter 1976, Lewis 1977) that are more dependent on zooplankton. Thus, Atlantic *Acropora* species are much more susceptible to increases in water turbidity than some other coral species.

Fertilization and development of elkhorn and staghorn corals is exclusively external. Embryonic development culminates with the development of planktonic larvae called planulae (Bak *et al.* 1977, Sammarco 1980, Rylaarsdam 1983). Unlike most other coral larvae, elkhorn and staghorn planulae appear to prefer to settle on upper, exposed surfaces, rather than in dark or cryptic ones (Szmant and Miller 2006), at least in a laboratory setting. Studies of elkhorn and staghorn corals indicated that larger colonies of both species had higher fertility rates than smaller colonies (Soong and Lang 1992).

3.4.4 South Atlantic Snapper Grouper Fishery Interactions with ESA-Listed Species

Sea turtles and smalltooth sawfish are the ESA-listed species most vulnerable to capture in the gear types (i.e., handline, rod and reel, black sea bass pots ,and longline) used in the snapper grouper fishery. The frequency and severity of interactions between these species and fishing gear varies greatly depending upon fishing effort, weather conditions, time of year, etc. The impacts of the snapper grouper fishery on ESA-listed species has been evaluated in previous ESA section 7 consultations. Entanglement in the hook-and-line gear is the primary route of effect to sea turtles and smalltooth sawfish from this fishery. **Table 3-1** illustrates the anticipated number and the type of interaction (i.e., lethal or non-lethal) for each ESA-listed species believed to interact with the fishery.

Table 3-1. Annual anticipated takes of ESA-listed species by the snapper grouper fishery

<table>
<tr><th rowspan="2"></th><th colspan="5">Sea Turtle Species</th></tr>
<tr><th>Loggerhead</th><th>Leatherback</th><th>Kemp's Ridley</th><th>Green</th><th>Hawksbill</th></tr>
<tr><th rowspan="3">South Atlantic Snapper Grouper</th><td>68-No more than 23 lethal</td><td>9-No more than 5 lethal</td><td>7-No more than 3 lethal</td><td>13-No more than 5 lethal</td><td>2-No more than 1 lethal</td></tr>
<tr><th colspan="5">Smalltooth Sawfish</th></tr>
<tr><td colspan="5">3-All non-lethal</td></tr>
</table>

3.5 Administrative Environment

3.5.1 The Fishery Management Process and Applicable Laws

3.5.1.1 Federal Fishery Management

Federal fishery management is conducted under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) (16 U.S.C. 1801 et seq.), originally enacted in 1976 as the Fishery Conservation and Management Act. The Magnuson-Stevens Act claims sovereign rights and exclusive fishery management authority over most fishery resources within the U.S. Exclusive Economic Zone (EEZ), an area extending 200 nautical miles 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 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 of Commerce (Secretary) is responsible for collecting and providing the data necessary for the councils to prepare fishery management plans and for promulgating regulations to implement proposed plans and amendments after ensuring that management measures are consistent with the Magnuson-Stevens Act and with other applicable laws summarized in **Appendix F**. In most cases, the Secretary has delegated this authority to NOAA Fisheries Service.

The South Atlantic Fishery Management 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 the States of North Carolina, South Carolina, Georgia, and east Florida to Key West. The Council has thirteen voting members: one from NOAA Fisheries Service; 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 Council Committees have full voting rights at the Committee level but not at the full Council level. Council members serve three-year terms and are recommended by State Governors and appointed by the Secretary of Commerce from lists of nominees submitted by State governors. Appointed members may serve a maximum of three consecutive terms. Public interests also are involved in the fishery management process through participation on Advisory Panels and through council meetings, which, with few exceptions for discussing personnel matters, are open to the public. The Council uses a 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 Procedures Act, in the form of “notice and comment” rulemaking.

3.5.1.2 State Fishery Management

The state governments of North Carolina, South Carolina, Georgia, and Florida have the authority to manage fisheries that occur in waters extending three nautical miles from their respective shorelines. North Carolina's marine fisheries are managed by the Marine Fisheries Division of the North Carolina Department of 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 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 ASMFC also is represented at the Council level, but does not have voting authority at the Council level.

NOAA Fisheries Service' 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.

3.6 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.

NOAA General Counsel issued a revised Southeast Region Magnuson-Stevens Act Penalty Schedule in June 2003, which addresses all Magnuson-Stevens Act violations in the Southeast Region. In general, this Penalty Schedule increases the amount of civil administrative penalties that a violator may be subject to up to the current statutory maximum of $120,000 per violation. NOAA General Counsel requested public comment through December 20 2010, on a new draft policy.

3.7 Economic and Social Environment

3.7.1 Economic Description of the Commercial Fishery

Additional information on the commercial snapper grouper fishery is contained in previous amendments [Amendment 13C (SAFMC 2006), Amendment 15A (SAFMC 2008a), Amendment 15B (SAFMC 2008b), Amendment 16 (SAFMC 2009a), and Amendment 17B (2010b)] and is incorporated herein by reference.

3.7.1.1 Gear and Fishing Behavior

The commercial snapper grouper fishery utilizes vertical lines, longlines, black sea bass pots/traps, spears, and powerheads (i.e., spears with spring-loaded firearms). Vertical lines are used from the North Carolina/Virginia border to the Atlantic side of Key West, Florida. The majority of hook and line fishermen use either electric or hydraulic reels (bandit gear) and generally have 2-4 bandit reels per boat. Historically, the majority of the bandit fleet fished year round for snapper grouper with the only seasonal differences in catch associated with the regulatory spawning season closures in March and April for gag. Amendment 16 (SAFMC 2009a) implemented a closed season from January through April for shallow water grouper and a commercial quota for vermilion snapper that could result in closures if the spring and/or fall sub-quotas are filled. Most fluctuations in fishing effort during the open seasons in this fishery are a result of the weather. Trips can be limited during hurricane season and during the winter months from December through March. Some fishermen stop bandit fishing to target king mackerel when they are running.

The Council allows the use of bottom longlines north of St. Lucie Inlet, Florida, in depths greater than 50 fathoms. Bottom longline gear is used to target snowy grouper and golden tilefish. Longline boats are typically bigger than bandit boats, their trips are longer, and they cost more to operate because they operate farther offshore. A longline spool generally holds about 15 miles of cable. Longlines are fished from daylight to dark because sea lice eat the flesh of hooked fish at night. The fishery is operated year long with little or no seasonal fluctuation barring hurricane disruption.

Spears or powerheads are most commonly used off Florida and are illegal for killing snapper grouper species in South Carolina and in Special Management Zones.

Black sea bass pots are used exclusively to target black sea bass, though bycatch of other snapper grouper species is allowed. The pots have mesh size, material, and construction restrictions to facilitate bycatch reduction. All sea bass pots must have a valid identification tag attached and more than 87% of tags in April 2003 were for vessels with homeports in North Carolina. Fishing practices vary by buoy practices, setting/pulling strategies, number of pots set, and length of set, with seasonal variations. The South Carolina pot fishery is mainly a winter fishery with short soak times (in some cases about an hour) and relatively few pots per boat. Most trips are day trips with pots being retrieved before heading to port. The North Carolina pot fishery also is primarily a winter fishery with some fishermen continuing to pot through the summer. North Carolina fishermen tend to use more pots than those in South Carolina. Although most North

Carolina trips with sea bass pots last one day, more pots are left to soak for several days than in South Carolina. Many participants in the black sea bass fishery are active in other fisheries, including the recreational charter fishery during the summer months. Many snapper grouper permit holders maintain pot endorsements but are not active in the pot fishery.

3.7.1.2 Landings, Ex-vessel Value, Price, and Effort

Amendment 17B (2010b) contains detailed information regarding a description of the snapper grouper fishery including landings, ex-vessel value of those landings, price and effort over time and that information is incorporated by reference here. However, updated general information is discussed here for context in discussion of the species and actions covered in this amendment. Detailed information regarding the landings, ex-vessel value, price, and effort applied by state is included below in **Section 3.7.1.4**.

Table 3-2 shows landings and revenues based on Accumulated Landings System (ALS) data for the snapper grouper fishery from 2005 to 2009. In 2009, the snapper grouper commercial fishery landed 8.4 million pounds with a dockside value of $17.7 million dollars. **Table 3-3** below shows the poundage landed by the vessels in the commercial snapper grouper fishery. On average, about 82% of snapper grouper vessels landed less than 10,000 pounds of snapper grouper species annually. A little over 2% harvested 50,000 pounds or more of snapper grouper species.

Table 3-2. Snapper Grouper Landings and Revenues, 2005-2009.

	2005	2006	2007	2008	2009	Average 2005-09
Landings (pounds)	7,359,876	6,939,582	7,157,371	8,097,906	8,432,900	7,656,940
Revenue (current dollars)	14,329,670	14,917,586	16,654,443	18,239,067	17,718,633	16,371,879

Note: SEFSC ACL Dataset for commercial landings from October 8, 2010.

Table 3-3. Number of vessels landing various poundage ranges of snapper grouper species, 2005-2009.

Landings (pounds)	Vessels 2005	Vessels 2006	Vessels 2007	Vessels 2008	Vessels 2009	Average Number of Vessels 2005-09
0-99	144	169	166	176	173	166
100-499	163	168	182	177	199	178
500-999	93	98	85	96	90	92
1,000-4,999	235	223	231	230	204	225
5,000-9,999	81	62	79	70	71	73
10,000-19,999	50	56	55	53	75	58
20,000-29,999	34	33	32	41	41	36
30,000-39,999	22	23	24	28	28	25
40,000-49,999	14	14	18	20	24	18
50,000-74,999	15	16	17	15	14	15
75,000-120,000	5	3	5	6	7	5

Note: NOAA Fisheries Southeast logbook database.

3.7.1.3 Fisheries by State

Amendment 17B (SAFMC 2010b) contains detailed information regarding a description of the snapper-grouper fishery by state and region including landings, ex-vessel value of those landings, price and effort over time and that information is incorporated by reference here.

3.7.1.4 Fisheries by Gear

Amendment 17B (SAFMC 2010b) contains detailed information regarding a description of the snapper-grouper fishery by gear including landings and ex-vessel value of those landings over time and that information is incorporated by reference here.

3.7.1.5 Commercial Fishery by Species

Table 3-4 shows 2005-2009 average landings and dockside revenues for each snapper grouper species in the snapper grouper complex. The table shows that gag revenues are 13% of total revenues from snapper grouper landings while vermilion snapper, black sea bass, and greater amberjack revenues are 17.7%, 5.8%, and 3.8% of total snapper grouper revenues.

Table 3-4. Average landings and dockside revenues for each snapper grouper species in the snapper grouper complex during 2005-2009.

Species	Average Landings 2005-09	Average Revenues 2005-09	Percentage of Total Revenue
almaco jack	141,026	$122,325	0.7%
amberjacks	199,639	$154,187	0.9%
banded rudderfish	35,397	$24,764	0.2%
bar jack	4,528	$4,525	0.0%
blue runner	173,419	$156,983	1.0%
coney	8	$19	0.0%
crevalle jack	208,540	$178,212	1.1%
graysby	520	$1,690	0.0%
greater amberjack	**643,791**	**$618,679**	**3.8%**
black grouper	78,390	$243,545	1.5%
gag	**618,711**	**$2,132,321**	**13.0%**
misty grouper	1,833	$5,138	0.0%
red grouper	475,981	$1,273,999	7.8%
snowy grouper	160,656	$447,183	2.7%
warsaw grouper	832	$1,902	0.0%
yellowedge grouper	18,641	$57,595	0.4%
yellowfin grouper	5,562	$18,637	0.1%
yellowmouth grouper	17	$44	0.0%
groupers	4,388	$11,311	0.1%
tomtate	15	$15	0.0%
white grunt	31,092	$35,178	0.2%
grunts	154,161	$139,004	0.8%
red hind	15,366	$41,742	0.3%
rock hind	22,786	$84,457	0.5%
speckled hind	2,311	$5,828	0.0%
hogfish	38,620	$105,494	0.6%
yellow jack	8	$8	0.0%
lesser amberjack	5,100	$4,629	0.0%
margate	3,576	$3,257	0.0%
jolthead porgy	2,361	$2,732	0.0%
knobbed porgy	20,487	$19,489	0.1%
longspine porgy	12	$7	0.0%
red porgy	122,134	$183,757	1.1%

Table 3-4. Continued. Average landings and dockside revenues for each snapper grouper species in the snapper grouper complex during 2005-2009.

Species	Average Landings 2005-09	Average Revenues 2005-09	Percentage of Total Revenue
whitebone porgy	7	$4	0.0%
scamp	319,350	$1,135,228	6.9%
scups or porgies	9,719	$9,085	0.1%
bank sea bass	355	$463	0.0%
rock sea bass	609	$228	0.0%
black sea bass	**493,702**	**$954,705**	**5.8%**
sheepshead	251,552	$223,943	1.4%
black snapper	141	$261	0.0%
blackfin snapper	816	$1,862	0.0%
cubera snapper	4,823	$8,884	0.1%
dog snapper	528	$615	0.0%
gray snapper	111,210	$221,136	1.4%
lane snapper	6,151	$13,465	0.1%
mahogany snapper	8	$30	0.0%
mutton snapper	82,891	$193,617	1.2%
queen snapper	4,804	$12,973	0.1%
red snapper	190,176	$665,855	4.1%
schoolmaster	186	$187	0.0%
silk snapper	16,402	$46,547	0.3%
vermilion snapper	**1,040,602**	**$2,895,834**	**17.7%**
yellowtail snapper	826,722	$2,081,342	12.7%
snappers	849	$1,679	0.0%
atlantic spadefish	33,429	$13,041	0.1%
golden tilefish	359,150	$815,912	5.0%
blueline tilefish	246,691	$379,472	2.3%
sand tilefish	2,205	$2,920	0.0%
triggerfishes	317,626	$425,778	2.6%
wreckfish	86,911	$188,153	1.1%
TOTAL	**7,597,527**	**$16,371,880**	**100.0%**

Note: SEFSC ACL Dataset for commercial landings from October 8, 2010.

Tables 3-5 to 3-12 provide detailed information regarding the four species discussed in this amendment, including landings, revenue, effort, and participation (vessels and dealers) based on the NOAA Fisheries Southeast Logbook Database.

Gag Grouper

Tables 3-5 and **3-6** show details regarding landings, revenues, and effort of gag. Landings of gag have decreased significantly since 2007 when a five year high of 515,834 pounds was harvested. Landings of gag are important to all four states in the South Atlantic region with high participation rates in North Carolina and Georgia/Florida (east coast, **Table 3-6**). An average trip between 2005 and 2009 took 95 pounds of gag (total average landings divided by total average trips in **Table 3-5**). However, this includes trips that took even small amounts of gag and where gag were not necessarily targeted. Therefore, those targeting gag would have a much higher average landings per trip.

Table 3-5. Annual landings, dockside revenue, trips, and boats with at least one pound of gag, 2005-2009 (landings in gutted weight).

	2005	**2006**	**2007**	**2008**	**2009**	**Average**
Trips with at least one pound of gag	4,398	4,162	5,006	4,442	4,722	4,546
Gag, thousands of pounds (gutted)	458,100	420,350	515,834	386,784	381,597	432,533
Dockside price, current $/pound	3.48	3.78	4.11	4.33	4.25	3.99
Revenue from gag (current $)	1,575,653	1,576,307	2,198,434	1,681,538	1,611,898	1,728,766
Number of boats that landed gag	308	264	312	295	297	295
Number of dealers that purchased gag	131	133	157	138	132	138

Note: NOAA Fisheries Southeast Logbook Database

Table 3-6. Annual trips for gag, landings, revenue, and vessels, by region, 2005-2009 (landing in gutted weight).

	2005	**2006**	**2007**	**2008**	**2009**	**Average**
North Carolina						
-trips	954	962	1,045	1,001	1,041	1,000
-landings (pounds)	148,033	130,634	122,322	110,926	143,708	131,124
-revenue (current $)	484,256	452,711	468,714	448,847	562,597	483,425
-vessels	87	90	102	114	118	102

Table 3-6. Continued. Annual trips for gag, landings, revenue, and vessels, by region, 2005-2009 (landing in gutted weight).

	2005	2006	2007	2008	2009	Average
South Carolina						
-trips	464	492	534	494	493	495
-landings (pounds)	183,257	173,208	204,511	148,845	116,502	165,264
-revenue (current $)	724,172	743,568	966,656	738,098	569,992	748,497
-vessels	47	48	53	49	47	48
Georgia and Florida (east coast)						
-trips	730	601	865	701	808	741
-landings (pounds)	125,743	115,501	185,408	126,514	121,066	134,846
-revenue (current $)	363,905	376,596	749,301	492,634	478,048	492,096
-vessels	138	108	123	111	119	119
Florida Keys						
-trips	51	26	59	25	19	36
-landings (pounds)	1,068	1,006	3,593	499	320	1,297
-revenue (current $)	3,321	3,432	13,763	1,959	1,261	4,747
-vessels	36	18	34	21	13	24

Note: NOAA Fisheries Southeast Logbook Database

Vermilion Snapper

Tables 3-7 and 3-8 show detailed information regarding landings, revenues, and effort applied toward vermilion snapper. Vermilion landings decreased by about 200,000 pounds in 2009 from previous years (except 2006). Vermilion snapper is important to all four states. An average trip between 2005 and 2009 harvested 402 pounds (total average pounds divided by total average trips in **Table 3-7**). However, this includes trips that took even small amounts of vermilion snapper and where vermilion snapper were not necessarily targeted. Therefore, those that are targeting vermilion snapper, would have a much higher average.

Table 3-7. Annual landings, dockside revenue, trips, and boats with at least one pound of vermilion, 2005-2009 (landings in gutted weight).

	2005	2006	2007	2008	2009	Average
Trips with at least one pound of vermilion	2,169	2,107	2,569	2,869	2,059	2,355
Vermilion, thousands of pounds (gutted)	1,037,493	779,119	1,007,251	1,084,204	820,518	945,717
Dockside price, current $/pound	2.83	3.16	3.22	3.26	3.07	3.10

Table 3-7. Continued. Annual landings, dockside revenue, trips, and boats with at least one pound of vermilion, 2005-2009 (landings in gutted weight).

	2005	2006	2007	2008	2009	Average
Revenue from vermilion (current $)	2,534,972	2,126,648	3,229,139	3,149,661	2,154,700	2,639,024
Number of boats that landed vermilion	259	237	281	322	270	274
Number of dealers that purchased vermilion	105	108	130	147	117	121

Note: NOAA Fisheries Southeast Logbook Database

Table 3-8. Annual trips for vermilion, landings, revenue, and vessels, by region, 2005-2009 (landings in gutted weight).

	2005	2006	2007	2008	2009	Average
North Carolina						
-trips	979	999	1,255	1,445	1,010	1,138
-landings (pounds)	379,732	288,384	470,654	511,701	315,164	393,127
-revenue (current $)	1,085,107	883,464	1,518,773	1,678,308	999,030	1,232,936
-vessels	95	88	120	134	124	67
South Carolina						
-trips	628	670	754	697	482	646
-landings (pounds)	381,558	233,602	246,202	216,045	136,708	242,823
-revenue (current $)	1,114,389	795,368	838,231	736,518	423,993	781,700
-vessels	52	53	65	60	54	85
Georgia and Florida (east coast)						
-trips	519	401	538	684	553	539
-landings (pounds)	271,454	252,992	289,239	349,225	366,586	305,899
-revenue (current $)	324,711	436,997	869,159	715,660	726,730	614,651
-vessels	85	74	78	100	80	83
Florida Keys						
-trips	43	37	22	43	14	32
-landings (pounds)	4,749	4,142	1,157	7,233	2,060	3,868
-revenue (current $)	10,766	10,820	2,976	19,175	4,947	9,737
-vessels	27	22	18	28	12	21

Note: NOAA Fisheries Southeast Logbook Database

Black Sea Bass

Tables 3-9 and **3-10** show detailed information regarding landings, revenues, and effort applied toward black sea bass. Black sea bass landings were highest in 2009 over previous years since 2005. Black sea bass is important to North Carolina and South Carolina, to a lesser degree. The importance of the black sea bass fishery is growing among some fishermen in northern Florida. An average trip between 2005 and 2009 harvested 198 pounds (total average pounds divided by total average trips in **Table 3-9**). However, this includes trips that took even small amounts of black sea bass and where black sea bass were not necessarily targeted. Therefore, those that are targeting black sea bass, would have a much higher average. In North Carolina, the average trip took 217 pounds of black sea bass (**Table 3-10**). In the Georgia/Florida East Coast area, landings increased from 6,329 pounds in 2008 to 39,014 pounds in 2009 while the number of trips increased by 37% (**Table 3-10**). The landings per trip averaged 21 pounds in 2008 and 96 pounds in 2009.

Table 3-9. Annual landings, dockside revenue, trips, and boats with at least one pound of black sea bass (BSB), 2005-2009 (landings in gutted weight).

	2005	**2006**	**2007**	**2008**	**2009**	**Average**
Trips with at least one pound of BSB	2,055	2,175	1,962	1,960	2,380	2,107
BSB, thousands of pounds (gutted)	390,137	445,951	346,981	371,578	529,121	416,753
Dockside price, current $/pound	2.16	2.52	2.77	2.60	2.57	2.52
Revenue from BSB (current $)	840,110	1,126,634	962,726	969,704	1,370,290	1,053,893
Number of boats that landed BSB	275	253	297	291	329	289
Number of dealers that purchased BSB	112	129	155	142	141	136

Note: NOAA Fisheries Southeast Logbook Database

Table 3-10. Annual trips for black sea bass, landings, revenue, and vessels, by region, 2005-2009 (landing in gutted weight).

	2005	2006	2007	2008	2009	Average
North Carolina						
-trips	1,277	1,476	1,217	1,165	1,426	1,312
-landings (pounds)	274,452	356,339	229,358	232,388	330,887	284,685
-revenue (current $)	625,237	927,528	683,739	654,074	890,041	788,845
-vessels	130	130	158	161	171	150
South Carolina						
-trips	508	498	512	498	547	513
-landings (pounds)	101,561	79,506	109,556	132,860	159,218	116,540
-revenue (current $)	198,668	184,615	268,065	304,087	403,879	290,162
-vessels	63	72	79	70	70	71
Georgia and Florida (east coast)*						
-trips	269	201	232	297	406	281
-landings (pounds)	14,114	10,106	8,062	6,329	39,014	15,525
-revenue (current $)	16,194	14,491	10,917	11,543	76,368	28,330
-vessels	81	51	59	60	87	68
Florida Keys						
-trips	-	-	-	-	-	-
-landings (pounds)	-	-	-	-	-	-
-revenue (current $)	-	-	-	-	-	-
-vessels	-	-	-	-	-	-

Note: NOAA Fisheries Southeast Logbook Database
* Georgia and Florida East Coast landings are combined to protect confidential data.

Greater Amberjack

Tables 3-11 and **3-12** show detailed information regarding landings, revenues, and effort applied toward greater amberjack. Greater amberjack landings in 2009 were 123,349 pounds greater than in 2008. Greater amberjack is important to Georgia/Florida (east coast) and the Florida Keys but receives a relatively low price per pound. The importance of the greater amberjack fishery is growing among some fishermen as other fisheries become more restrictive. An average trip between 2005 and 2009 harvested 339 pounds (total average pounds divided by total average trips in **Table 3-11**). However, this includes trips that took even small amounts of greater amberjack and where greater amberjack were not necessarily targeted. Therefore, those that are targeting greater amberjack, would have a much higher average (**Table 3-12**). In the Florida Keys, average landings per trip was 637 pounds on average.

Table 3-11. Annual landings, dockside revenue, trips, and boats with at least one pound of greater amberjack (GA), 2005-2009 (landings in gutted weight).

	2005	2006	2007	2008	2009	Average
Trips with at least one pound of GA	1,924	1,590	2,000	2,193	2,489	2,039
GA, thousands of pounds (gutted)	783,586	549,138	611,144	693,205	816,554	690,725
Dockside price, current $/pound	0.92	1.06	1.02	1.08	0.99	1.01
Revenue from GA ($)	588,036	469,703	604,252	646,080	724,800	606,574
Number of boats that landed GA	297	284	340	350	391	332
Number of dealers that purchased GA	113	107	134	128	132	123

Note: NOAA Fisheries Southeast Logbook Database

Table 3-12. Annual trips for greater amberjack, landings, revenue, and vessels, by region, 2005-2009 (landings in gutted weight).

	2005	2006	2007	2008	2009	Average
North Carolina						
-trips	310	299	393	541	558	420
-landings (pounds)	53,492	39,306	42,102	81,654	75,006	58,312
-revenue (current $)	-	-	-	-	-	-
-vessels	69	78	105	118	124	99
South Carolina						
-trips	316	351	429	351	344	358
-landings (pounds)	73,440	70,489	79,702	74,009	76,662	74,860
-revenue (current $)	-	-	75,084	83,139	65,395	74,539
-vessels	41	44	55	45	43	45.6

Table 3-12. Continued. Annual trips for greater amberjack, landings, revenue, and vessels, by region, 2005-2009 (landings in gutted weight).

	2005	2006	2007	2008	2009	Average
Georgia and Florida (east coast)						
-trips	648	475	718	803	1,024	734
-landings (pounds)	176,410	121,991	197,301	250,691	364,080	222,095
-revenue (current $)	135,117	110,452	195,770	239,287	337,055	203,536
-vessels	111	102	125	133	155	125
Florida Keys						
-trips	650	465	460	498	563	527
-landings (pounds)	480,243	317,352	292,039	286,850	300,807	335,458
-revenue (current $)	452,918	359,251	333,398	323,654	322,350	358,314
-vessels	76	60	55	54	69	63

Note: NOAA Fisheries Southeast Logbook Database

3.7.1.6 Economic Activity

Estimates of the average annual economic activity (impacts) associated with the commercial fisheries for snapper grouper species addressed in the amendment were derived using the model developed for and applied in NMFS (2009) and are provided in **Table 3-13**. Business activity for the commercial sector is characterized in the form of full-time equivalent (FTE) jobs, income impacts (wages, salaries, and self-employed income), and output (sales) impacts (gross business sales). Income impacts should not be added to output (sales) impacts because this would result in double counting.

The annual period refers to the calendar year and not the fishing year. While calendar-year totals may not match the fishing year for a particular species, calendar year estimates should be adequate for describing the economic activity associated with each species. These estimates are based on 2006-2009 data for black sea bass and 2005-2009 data for all other species. The black sea bass assessment did not include 2005 data because of considerations of the effects of regulatory change that went in effect in 2006 as a result of Amendment 13C.

The estimates of economic activity include the direct effects (effects in the sector where an expenditure is actually made), indirect effects (effects in sectors providing goods and services to directly affected sectors), and induced effects (effects induced by the personal consumption expenditures of employees in the direct and indirectly affected sectors). Estimates are provided for the economic activity associated with the ex-vessel revenues from the individual snapper grouper species as well as the revenues from all species harvested by these same vessels.

Table 3-13. Average annual economic activity associated with the species in this amendment.

Species	Average Ex-vessel Value[1] (1,000s)	Total Jobs	Harvester Jobs	Output (Sales) Impacts (1,000s)	Income Impacts (1,000s)
Black Sea Bass	$1,093	206	27	$14,391	$6,133
- All Species[2]	$3,918	738	96	$51,586	$21,986
Vermilion Snapper	$2,964	559	73	$39,025	$16,632
- All Species	$5,321	1,003	131	$70,059	$29,858
Gag	$2,157	407	53	$28,400	$12,104
- All Species	$5,751	1,084	141	$75,721	$32,271
Greater Amberjack	$0.730	138	18	$9,612	$4,096
- All Species	$4,975	1,075	140	$75,115	$32,013

[1]2008 dollars.
[2]Includes ex-vessel revenues and economic activity associated with the average annual harvests of all species harvested by vessels that harvested the subject snapper grouper species.

3.7.1.7 Imports

The National Marine Fisheries Service purchases fisheries trade data from the Foreign Trade Division of the U.S. Census Bureau. Data are available for download at http://www.st.nmfs.noaa.gov/st1/trade/index.html. The list of product codes relevant to this data request includes fresh and frozen snappers, fresh and frozen groupers, frozen sea basses and frozen dolphin fillets. Wreckfish and golden crab do not appear in the list of product codes in the imports database (see the drop-down menu for products at http://www.st.nmfs.noaa.gov/st1/trade/build_a_database/TradeSelectDateProduct.html). Groupers are substitutes for wreckfish. Golden crab competes in the market for snow crab and Dungeness crab.

Data are summarized from 1991-2009. Imports are tabulated in thousands of pounds, product weight. Import values are tabulated in thousands of current year dollars and constant 2009 dollars.

Product Codes for finfish products

- 0302694040 = Snappers (Lutjanidae), fresh or chilled, 1990-2007;
- 0302695058 = Snappers (Lutjanidae), fresh or chilled, 2007-present;
- 0303794075 = Snappers (Lutjanidae), frozen, 1990-2007;
- 0303790067 = Snappers (Lutjanidae), frozen, 2007-present;
- 0302694060 = Groupers, fresh or chilled, 1990-2007;
- 0302695061 = Groupers, fresh or chilled, 2007-present;
- 0303794080 = Groupers, frozen, 1990-2007;
- 0303790070 = Groupers, frozen, 2007-present;
- 0303770000 = Sea Bass, frozen, 1989-present;

Imported products relevant to the Snapper Grouper FMP include fresh and frozen snappers, fresh and frozen groupers, and frozen sea basses. Data are available from 1991-present.

Imports of fresh snappers increased from approximately 10.8 million pounds (product weight) worth $16.0 million (current dollars) in 1991 to 21.5 million pounds worth $49.4 million in 2009. Imports peaked at 29.0 million pounds worth $60.2 million in 2007 before declining in 2008 and 2009. The recent decline in imports probably is linked to the general slow-down of economic activity in the U.S. Imports of fresh snapper primarily originated in Mexico, Central America, or South America, and entered the U.S. through the port of Miami. On average from 2006-2009, imports were above average during the months of March, April and May, and below average in November, December and January.

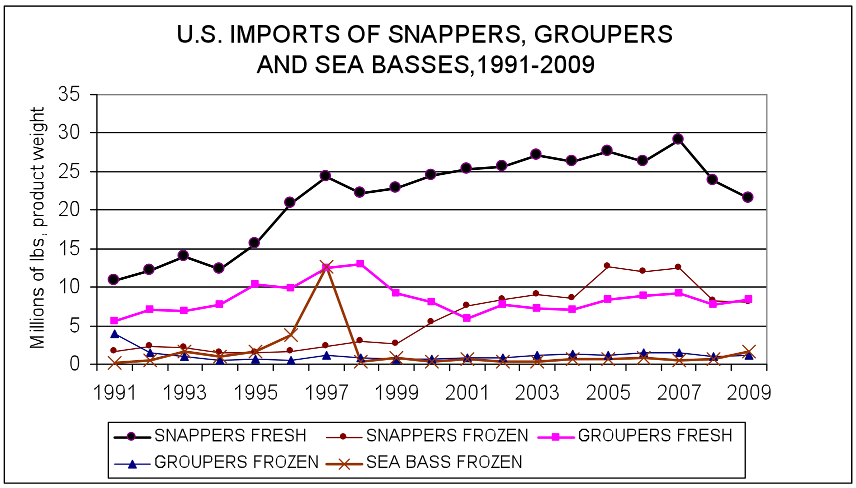


Figure 3-1. Imports relevant to the South Atlantic Snapper Grouper Fishery Management Plan.

Imports of frozen snappers were relatively minor from 1991 through 1999, and ranged from 1.4 million pounds (product weight) worth $1.9 million (current dollars) in 1995 to 2.9 million pounds worth $4.0 million in 1998 (**Figure 3-1**). However, imports doubled from 1999 to 2000 and increased to a peak of 12.7 million pounds worth $19.4 million in 2005. Imports remained relatively steady through 2007 and then declined to 8.1 million pounds worth $15.9 million in 2009. Imports of frozen snappers primarily originated in Brazil and entered the U.S. through the port of Miami, or originated from Indonesia and entered the U.S. through New York or Los Angeles. Imports of frozen snappers tend to be greatest during December and January and lowest in March, April and May.

Imports of fresh groupers increased from 5.6 million pounds (product weight) worth $6.1 million (current dollars) in 1991 to a peak of 12.9 million pounds worth $18.6 million in 1998. Imports have remained relatively steady since 1999, with an annual average of 8.0 million pounds worth $18.1 million. Imports generally originated in Mexico, and in Panama to a much lesser extent, and entered the U.S. in Miami. Prior to 2006, imports of fresh groupers were above average in March and April and below average in October and November. However, imports in March have declined significantly since 2006.

Imports of frozen grouper were relatively minor, and averaged 1.0 million pounds worth $1.6 million since 2006. Imports generally originated in Mexico or Asia, and entered the U.S. in Miami, Tampa or San Juan. On average from 2006-2009, imports of frozen groupers were above average from December through April and below average from June through August.

Imports of frozen sea basses were relatively minor except in 1997 with 12.6 million pounds (product weight) worth $28.7 million (current year dollars). Imports averaged 0.6 million pounds worth $1.8 million from 1998-2008. However, imports of frozen sea bass increased to 1.7 million pounds worth $4.3 million in 2009, with nearly 0.8 million pounds imported in January 2009. Frozen sea bass most commonly were imported from Taiwan and entered the U.S. in Los Angeles. Since 2006, imports were greatest between January and March and lowest from August through December.

3.7.2 Economic Description of the Recreational Fishery

Only the proposed action on the black sea bass component of the snapper grouper fishery includes alternatives that would affect the recreational sector. As a result, the following discussion only addresses economic considerations relevant to recreational fishing for black sea bass. A description of the recreational component of the snapper grouper fishery is contained in Amendment 17B (SAFMC 2010b) and is incorporated herein by reference.

The recreational fishery is comprised of the private sector and 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 charterboat and headboat (also called partyboat) sectors. Charterboats generally carry fewer passengers and charge a fee on an entire vessel basis, whereas headboats carry more passengers and payment is per person.

3.7.2.1 Harvest

For recreational landings information in the black sea bass component of the snapper grouper fishery, the reader is referred to **Section 4.1.1** of this document.

3.7.2.2 Effort

Recreational effort derived from the MRFSS database 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 average annual black sea bass recreational effort, 2005-2009, are provided in **Tables 3-14** to **3-17**. While South Carolina dominates all other states in black sea bass target trips, North Carolina and Florida show higher black sea bass catch trips than South Carolina or Georgia (**Table 3-14**). The private mode is the dominant fishing mode for both target and catch trips (**Table 3-15**). The dominance of the private fishing mode also holds for each of the states in the South Atlantic (**Table 3-16**).

Table 3-14. Average annual black sea bass recreational effort in the South Atlantic, across all modes, 2005-2009.

	State					
	Florida	**Georgia**	**North Carolina**	**South Carolina**	**Total**	**All Trips**
Target Effort	10,076	4,744	8,532	24,832	48,184	21,597,979
Catch Effort	205,909	48,938	230,900	154,526	640,273	

Source: MRFSS, NOAA Fisheries, NMFS, SERO.

Table 3-15. Average annual black sea bass recreational target effort in the South Atlantic, across all states, 2005-2009.

	Mode				
	Shore	**Charter**	**Private**	**Total**	**All Trips**
Target Effort	1,438	3,812	42,934	48,184	21,597,979
Catch Effort	90,607	36,130	513,537	640,273	

Source: MRFSS, NOAA Fisheries, NMFS, SERO.

Table 3-16. Average annual black sea bass recreational effort, by state and mode, 2005-2009.

	Shore		Charter		Private		Total	
State	**Target**	**Catch**	**Target**	**Catch**	**Target**	**Catch**	**Target**	**Catch**
Florida	818	24,882	99	4,714	9,158	176,313	10,076	205,909
Georgia	0	9,265	368	6,140	4,376	33,532	4,744	48,938
North Carolina	620	48,018	110	10,588	7,803	172,294	8,532	230,900
South Carolina	0	8,441	3,236	14,688	21,596	131,397	24,832	154,526

Source: MRFSS, NOAA Fisheries, NMFS, SERO.

Similar analysis of recreational effort is not possible for the headboat sector because the 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.
The average annual (2005-2009) number of headboat angler days is presented in **Table 3-17**. Due to confidentiality issues, Georgia estimates are combined with those of Florida. As shown in **Table 3-17**, the total (across all states) average number of headboat angler days has been variable but generally declining since 2005.

Table 3-17. Southeast headboat angler days, 2005-2009.

	South Atlantic			
	Florida/ Georgia	North Carolina	South Carolina	Total
2005	171,078	31,573	34,036	236,687
2006	175,522	25,736	56,074	257,332
2007	157,150	29,002	60,729	246,881
2008	124,119	16,982	47,287	188,388
2009	136,420	19,468	40,919	196,807
Average	152,858	24,552	47,809	225,219

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

3.7.2.3 Permits

On January 11, 2011, there were 1,453 snapper grouper for-hire permits. 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.

3.7.2.4 Economic Value, Expenditures, and Economic Activity for the Recreational Sector

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. 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.

While anglers receive economic value as measured by the consumer surplus associated with fishing, for-hire businesses receive value from the services they provide. Producer surplus is the measure of the economic value these operations receive. Producer surplus is the difference between the revenue a business receives for a good or service, such as a charter or headboat trip, and the cost the business incurs to provide that good or service. Estimates of the producer surplus associated with for-hire trips are not available. However, proxy values in the form of net operating revenues are available (David Carter, NMFS SEFSC, personal communication, August 2010). These estimates were culled from several studies – Liese *et al.* (2009), Dumas *et al.* (2009), Holland *et al.* (1999), and Sutton *et al.* (1999). Estimates of net operating revenue per angler trip (2009 dollars) on representative charter trips (average charter trip regardless of area fished) are $146 for Louisiana through east Florida, $135 for east Florida, $156 for northeast Florida, and $128 for North Carolina. For charter trips into the EEZ only, net operating revenues are $141 in east Florida and $148 in northeast Florida. For full-day and overnight trips only, net operating revenues are estimated to be $155-$160 in North Carolina. Comparable estimates are not available for Georgia, South Carolina, or Texas.

Net operating revenues per angler trip are lower for headboats than for charterboats. Net operating revenue estimates for a representative headboat trip are $48 in the Gulf of Mexico (all states and all of Florida), and $63-$68 in North Carolina. For full-day and overnight headboat trips, net operating revenues are estimated to be $74-$77 in North Carolina. Comparable estimates are not available for Georgia and South Carolina.

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

Estimates of the economic activity (impacts) associated with recreational fishing for black sea bass were derived using average coefficients for recreational angling across all fisheries (species), as derived by an economic add-on to the MRFSS, and described and utilized in NMFS (2009). Business activity is characterized in the form of FTE jobs, income impacts (wages, salaries, and self-employed income), output (sales) impacts (gross business sales), and value-added impacts (difference between the value of goods and the cost of materials or supplies). Job and output (sales) impacts are equivalent metrics across both the commercial and recreational sectors. Income and value-added impacts are not equivalent, though similarity in the magnitude of multipliers may result in roughly equivalent values. Neither income nor value-added impacts should be added to output (sales) impacts because this would result in double counting. Job and output (sales) impacts, however, may be added across sectors.

Estimates of the average expenditures by recreational anglers are provided in NMFS (2009) and are incorporated herein by reference. Estimates of the average black sea bass recreational effort (2005-2009) and associated economic impacts (2008 dollars) are provided in **Table 3-18**. Target trips were used as the measure of recreational effort. As previously discussed, more trips may catch a species than target the species. Where such occurs, estimates of the economic activity associated with the average number of catch trips can be calculated based on the ratio of catch trips to target trips because the average output impact and jobs per trip cannot be differentiated by trip intent. For example, if the number of catch trips is three times the number of target trips for a particular state and mode, the estimate of the associated business activity would equal three times the estimate associated with target trips. **Tables 3-14** to **3-16** contain estimates of the average annual (2005-2009) black sea bass target trips and catch trips for each state and mode.

It should be noted that output impacts and value added impacts are not additive and the impacts for individual species should not be added because of possible duplication (some trips may target multiple species). Also, the estimates of economic activity should not be added across states to generate a regional total because state-level impacts reflect the economic activity expected to occur within the state before the revenues or expenditures "leak" outside the state, possibly to another state within the region. Under a regional model, economic activity that "leaks" from, for example, Florida into Georgia, would still occur within the region and continue to be tabulated.

As a result, regional totals would be expected to be greater than the sum of the individual state totals. Regional estimates of the economic activity associated with black sea bass recreational fishing are unavailable at this time.

The distribution of the estimates of economic activity by state and mode are consistent with the effort distribution with the exception that charter anglers, on average, spend considerably more money per trip than anglers in other modes. As a result, the number of charter trips can be a fraction of the number of private trips, yet generate similar estimates of the amount of economic activity. For example, as derived from **Table 3-18**, the average number of black sea bass target trips in South Carolina (3,236 trips) was only approximately 15% of the number of private trips (21,596), whereas the estimated output (sales) impacts by the charter anglers (approximately $1.1 million) was approximately 115% of the output impacts of the private trips (approximately $950,000).

Table 3-18. Summary of black sea bass target trips (2005-2009 average) and associated economic activity (2008 dollars). Output and value added impacts are not additive.

	North Carolina	South Carolina	Georgia	East Florida
	Shore Mode			
Target Trips	620	0	0	818
Output Impact	$155,289	$0	$0	$23,368
Value Added Impact	$86,473	$0	$0	$13,567
Jobs	2	0	0	0
	Private/Rental Mode			
Target Trips	7,803	21,596	4,376	9,158
Output Impact	$425,915	$950,182	$68,369	$346,311
Value Added Impact	$240,160	$554,419	$41,472	$206,939
Jobs	5	11	1	4
	Charter Mode			
Target Trips	110	3,236	368	99
Output Impact	$42,821	$1,091,268	$23,134	$38,798
Value Added Impact	$24,031	$616,522	$13,502	$22,842
Jobs	1	14	0	0

Table 3-18. Continued. Summary of black sea bass target trips (2005-2009 average) and associated economic activity (2008 dollars). Output and value added impacts are not additive.

	North Carolina	South Carolina	Georgia	East Florida
	All Modes			
Target Trips	8,533	24,832	4,744	10,075
Output Impact	$624,025	$2,041,451	$91,503	$408,478
Value Added Impact	$350,665	$1,170,940	$54,974	$243,348
Jobs	7	25	1	4

Source: effort data from the MRFSS, economic activity results calculated by NMFS SERO using the model developed for NMFS (2009).

As previously noted, the values provided in **Tables 3-14** to **3-16** only reflect effort derived from the MRFSS/MRIP. Because the headboat sector in the Southeast is not covered by the MRFSS/MRIP, the results in **Table 3-18** do not include estimates of the economic activity associated with headboat anglers. While estimates of headboat effort are available (see **Table 3-17**), species target information is not collected in the Headboat Survey, which prevents the generation of estimates of the number of headboat target trips for individual species. Further, because the model developed for NMFS (2009) was based on expenditure data collected through the MRFSS/MRIP, expenditure data from headboat anglers was not available and appropriate economic expenditure coefficients have not been estimated. As a result, estimates of the economic activity associated with the headboat sector comparable to those of the other recreational sector modes cannot be provided.

3.7.3 Social and Cultural Environment

Descriptions of the social and cultural environment of the snapper grouper fishery are contained in Jepson *et al.* (2005) and Amendment 17B (SAFMC 2010b) and are incorporated herein by reference. The following information utilizes NMFS summary harvest data (2005-2009) located at http://www.st.nmfs.noaa.gov/st1/commercial/landings/annual_landings.html to identify the states which have accounted for the highest commercial landings of the species covered by this proposed amendment and 2008 NMFS Accumulated Landings System (ALS) data to identify the number of communities and dealers with recording landings of each respective species. More recent ALS data, which summarizes harvest information at the community level, is not available.

For the four species covered by this proposed amendment, over the period 2005-2009, North Carolina recorded the highest proportion of black sea bass (approximately 81% of regional commercial harvests in terms of pounds landed), gag (approximately 37%, and vermilion snapper (approximately 48%). Florida was the dominant state for the remaining species, greater amberjack, accounting for approximately 93% of regional harvests. Among all four species, gag harvests were the most evenly distributed among multiple states, with South Carolina following North Carolina (37%) closely at approximately 36% and Florida with approximately 26%. Vermilion snapper was the next most evenly distributed species, with South Carolina and Florida accounting for approximately 27% and 23% of total regional harvests, respectively.

In 2008, a total of 104 dealers located in 54 communities recorded landings of black sea bass, led by 63 dealers in 28 communities located in North Carolina. The North Carolina communities with the highest landings and at least three dealers were Sneads Ferry, Wanchese, Beaufort, and Wilmington. In South Carolina, which recorded the second highest black sea bass commercial harvests over 2005-2009, dealers in Little River recorded the highest landings.

For vermilion snapper, 107 dealers in 61 communities recorded landings in 2008, led by 52 dealers in 26 communities in North Carolina, and 34 dealers in 23 communities in Florida. The communities in North Carolina with at least three dealers and the highest landings were Morehead City, Beaufort, and Sneads Ferry. No Florida community with substantive landings of vermilion snapper met the three-dealer threshold. South Carolina recorded fewer dealers and communities than Florida, 18 and 8, respectively, with Murrells Inlet and Little River the dominant communities.

Gag purchases in 2008 were distributed among 107 dealers in 62 communities, led by 48 dealers in 29 communities in Florida, 43 dealers in 24 communities in North Carolina, and 14 dealers in 8 communities in South Carolina. The communities with the largest volume of activity and at least three dealers were Wilmington and Hampstead in North Carolina, whereas no communities in either Florida or South Carolina satisfied the three-dealer threshold.

Finally, 36 dealers in 25 communities recorded purchases of greater amberjack in 2008, led by 33 dealers in 22 communities in Florida. Only two communities, however, Miami and Ft. Pierce, recorded significant landings and had three or more dealers recording purchases.

Descriptions of most of the communities listed above can be found in Jepson *et al.* (2005). Jepson *et al.* (2005) also contains description of numerous other South Atlantic communities with substantial fishing activity, but which have not have been listed due to confidentiality concerns. Substantially more overlap of key communities could be seen if confidentiality issues did not exist. Further, it is emphasized that the listing of these communities should not be assumed to directly imply significant social vulnerability to supply disruption of these species, as vulnerability would be a function of the importance of an individual species or species group relative to total harvests of all other species. For example, while Sneads Ferry was the top landing destination for black sea bass in North Carolina in 2008, black sea bass accounted for only approximately 7% of total landings in both pounds and value. The relevant proportions for Wilmington are 2% of pounds and 3.5% of revenues. These proportions do not necessarily imply that black sea bass are not a significant revenue or cultural species to individual fishermen, dealers, or the community as a whole in either community. Rather, this example is provided to simply emphasize that a more holistic examination is required to determine the significance of the potential social effects of harvest changes motivated by regulatory action.

4.0 Environmental Effects

4.1 Harvest Management Measures for Black Sea Bass

Alternative 1 (No Action). Do not implement harvest management measures to reduce the rate at which the quota for black sea bass is being met.

Alternative 2. Establish a commercial trip limit for the black sea bass fishery (all gear).
- **Sub-Alternative 2a.** Establish a 500 pounds gw (590 pounds ww) trip limit.
- **Sub-Alternative 2b.** Establish a 750 pounds gw (885 pounds ww) trip limit.
- **Sub-Alternative 2c.** Establish a 1,000 pounds gw (1,180 pounds ww) trip limit.
- **Sub-Alternative 2d.** Establish a 1,250 pounds gw (1,475 pounds ww) trip limit.
- **Sub-Alternative 2e.** Establish a 1,000 pounds gw (1,180 pounds ww) trip limit; reduce to 500 pounds gw (590 pounds ww) when 75% of the quota is met.
- **Sub-Alternative 2f.** Establish a 2,000 pounds gw (2,360 pounds ww) trip limit.
- **Sub-Alternative 2g.** Establish a 2,500 pounds gw (2,950 pounds ww) trip limit.
- **Sub-Alternative 2h.** Establish a 340 pounds gw trip limit.

Alternative 3 (Preferred). Retain the June-May fishing year. Specify separate commercial ACLs (quotas) for June-November and December-May based on landings from 2006-2009.

Alternative 4. Retain the June-May fishing year. Specify commercial ACLs (quotas) for June-December and January-May based on landings from 2006-2009.

Alternative 5. Change the black sea bass fishing year to November-October. Specify separate commercial ACLs (quotas) for November-April 30 and May 1-October based on landings from 2006-2009.

Alternative 6. Change the black sea bass fishing year to January-December. Separate commercial ACLs (quotas) for January-June and July-December based on landings from 2006-2009.

Alternative 7 (Preferred). Under Alternatives 3-6, carry over unused portion of commercial ACL (quota) from first part of fishing year to second portion of season.

Alternative 8. Under Alternatives 3-6, carry over unused portion of commercial ACL (quota) from second part of fishing year to next fishing year.

Alternative 9. Under Alternatives 3-6, close fishing for black sea bass with pots when all but 100,000 pounds of the commercial ACL (quota) is harvested. Fishing with other allowable gear types would occur for the remainder of the sub-season. Start second season for the remainder of the ACL (quota) for all allowable gear types.

Alternative 10. Under Alternatives 3-6, close fishing for black sea bass with pots when all but 50,000 pounds of the commercial ACL (quota) is harvested. Fishing with other allowable gear types would occur for the remainder of the sub-season. Start second season for the remainder of the ACL (quota) for all allowable gear types.

Alternative 11. Close the pot fishery when 90% of the commercial ACL (quota) is met.

Alternative 12. Establish a spawning season closure for black sea bass.

Sub-Alternative 12a. Implement a March 1-April 30th spawning season closure for black sea bass, would apply to commercial and recreational sectors.

Sub-Alternative 12b. Implement an April 1st-May 31st spawning season closure for black sea bass, would apply to commercial and recreational sectors.

Sub-Alternative 12c. Implement a March 1st- May 31st spawning season closure for black sea bass, would apply to commercial and recreational sectors.

Sub-Alternative 12d. Implement a May 1st- May 31st spawning season closure for black sea bass, would apply to commercial and recreational sectors.

Alternative 13. Modify the recreational bag limit for black sea bass

Sub-Alternative 13a. Reduce the recreational bag limit from 15 to 7 black sea bass per person per day.

Sub-Alternative 13b (Preferred). Reduce the recreational bag limit from 15 to 5 black sea bass per person per day.

Sub-Alternative 13c. Reduce the recreational bag limit from 15 to 3 black sea bass per person per day.

Sub-Alternative 13d. Reduce the recreational bag limit from 15 to 2 black sea bass per person per day.

Sub-Alternative 13e. Reduce the recreational bag limit from 15 to 1 black sea bass per person per day.

4.1.1 Biological Effects

Amendment 13C (SAFMC 2006), reduced the black sea bass quota, which is equal to the commercial ACL, over three years from 477,000 pounds gutted weight (June 2006-May 2007), 423,000 pounds gutted weight (June 2007-May 2008), and 309,000 pounds gutted weight (June 2008-May 2009). Amendment 16 (SAFMC 2009a) established a January-April spawning season closure for shallow water grouper and reduced the quota for vermilion snapper, and likely resulted in increased effort in the black sea bass fishery during the 2009 fishing year.

In part due to effort shifts as a result of Amendments 13C and 16, the black sea bass 309,000 pounds gutted weight quota was met on December 20, 2009, for the June 2009-May 2010 fishing year. **Alternative 1 (No Action)** would not implement any regulations to slow down the rate at which the quota is being met for black sea bass. The increase in landings during the June 2009 to May 2010 fishing year appears to be the result of increased effort. The average catch per pot was similar during 2008 and 2009 (**Table 4-1**). However, the number of trips that fished pots increased by 64% in the June 2009 to May 2010 fishing year than during the previous fishing year (**Table 4-2**). There was also an increase in the number of trips that caught black sea bass with other gear types (predominantly hook and line).

Table 4-1. Average catch per trip (pounds gutted weight) and percentage of landings from pots during fishing years (June – May) for 2006-2009.
Other category is 99% hook and line gear. NMFS logbook data.

Year	All Gear	Pots	Other	% Pot Landings
2006	214	554	31	90.62%
2007	165	501	25	89.15%
2008	198	621	28	89.81%
2009	188	643	31	87.83%

Table 4-2. Number of trips by gear for black sea bass taken during June-December 2008 and 2009.
Other category is 99% hook and line gear. NMFS logbook data.

	2008			2009		
Month	All gear	Pots	Other	All Gear	Pots	Other
6	197	17	180	274	46	228
7	198	24	174	229	37	192
8	179	22	157	244	47	197
9	88	11	77	241	74	167
10	138	34	104	200	65	135
11	194	58	136	210	73	137
12	172	71	101	108	47	61
Total	1,166	237	929	1,506	389	1,117
Percent increase				29.16%	64.14%	20.24%

Alternative 2 would consider a single trip limit for black sea bass harvested with pot and hook and line. To determine trip limits for black sea bass under **Alternative 2**, it was necessary to account for the increased effort that occurred in 2009. As the black sea bass fishery closed on December 20, 2009, landings were estimated for January-May 2010. This was done by using trip information from the NMFS logbook during January-May 2009 and increasing the number of trips by 64% for the pot fishery, and by 20% for the remaining gear (predominantly hook and line) during that time period. It is noted that the quota was met sooner during the 2010 fishing year so projected dates when quota is met for the various trip limits could be an underestimate.

Based on estimated data for the June 2009-May 2010 fishing year, a 500-pound gutted weight trip limit (**Sub-Alternative 2a**) would keep the fishery open into the start of February 2010 and about six weeks longer than **Alternative 1 (No Action)** (**Table 4-3**). Trip limits of 750 to 1,250 pounds gutted weight would result in January closures (**Sub-Alternatives 2b-2d**), and **Sub-Alternative 2e**, which would reduce a 1,000 pounds gutted weight trip limit to 500 pounds gutted weight when 75% of the quota is met would have a similar effect as **Sub-Alternative 2a**. The similarities among the alternatives are likely due to an average catch that is lower than the specified trip limits in **Sub-Alternatives 2b-2e**. Therefore, many trips are not constrained by the trip limits.

Table 4-3. Projected date of black sea bass commercial closure various trip limits. Shaded area represents date the 309,000 pounds gutted weight quota was actually met.
Values in parentheses represent expected landings at end of fishing year if quota not met.

Fishing Year	**Alternative 1** No trip limit.	**Alternative 2a** 500 pounds trip limit.	**Alternative 2b** 750 pounds trip limit.	**Alternative 2c** 1,000 pounds trip limit.	**Alternative 2d** 1,250 pounds trip limit.	**Alternative 2e** 1,000 pounds trip limit reduce to 500 pounds trip limit when 75% quota met.
June 2006-May 2007	12-Feb	29-May	16-Mar	28-Feb	25-Feb	15-Mar
June 2007-May 2008	23-May	Not met (226,947)	Not met (273,051)	Not met (295,228)	Not met (307,587)	Not met (280,303)
June 2008-May 2009	25-Feb	Not met (249,126)	Not met (305,768)	23-Mar	7-Mar	30-Apr
June 2009-May 2010	20-Dec	9-Feb	19-Jan	6-Jan	5-Jan	28-Jan

Sub-Alternative 2f would establish a 2,000 pounds gutted weight (2,360 pounds whole weight) trip limit. **Table 4-5** reveals that less than 1% of trips with all gear types had catches at or greater than this trip level. Therefore, under **Sub-Alternative 2f** the expected quota closure dates would be almost identical to **Alternative 1 (No Action)** and would have little effect of extending the black sea bass fishery. **Sub-Alternative 2g** would establish a 2,500 pounds gutted weight (2,775 pounds whole weight) tip limit. As with **Sub-Alternative 2f**, a 2,500 pounds trip limit would provide little effect on extending the fishing season for black sea bass.

Sub-Alternative 2h would specify a trip limit that would allow the black sea bass fishery to remain open throughout the June-May fishing year. In the absence of a closure, it is estimated that the increased effort would have resulted in landings of 660,126 pounds gutted weight during the June 2009 to May 2010 fishing year. An approximate trip limit of 340 pounds gutted weight would be needed to keep the 2009 fishing year open (**Table 4-4**). Amendment 18A is under development and includes proposed actions to limit the number of pots that can be fished and the requirement that fishermen return pots to shore at the conclusion of a trip. There is a possibility that fishermen could exceed the trip limit when retrieving pots and fishermen would have to empty the catch from the pots. As shown in **Table 4-5**, only 14% of the trips exceeded at trip level of 508 pounds gutted weight. In contrast, only 4 to 5% of pot trips had catches greater than 1,000 pounds gutted weight (**Table 4-5**). Although release mortality of black sea bass from pots is considered to be low, some mortality would be expected if fishermen were to release fish from pots after a trip limit is met.

Table 4-4. Reduction in total catch and approximate trip limit needed to keep fishery open all year based on data from black sea bass June-May fishing years for 2006-2009.

Year	Reduction	Trip limit
2008	6%	1,271
2009*	53%	340

*Data for 2009 are estimated after closure assuming similar increase in effort during June – December 2009.

Table 4-5. Trip limit, number of trips, amount of pounds (gutted weight), and percent reduction in harvest provided by a trip limit during June 2008 - May 2009 and June 2009 - May 2010 fishing years. Includes all gear.

	2008				2009			
Trip Limit	# Trips	% Trips	Pounds over trip	% Reduct	# Trips	% Trips	Pounds over trip	% Reduct
0	1,968	100.00%	388,420	100.00%	1,602	100.00%	371,061	100.00%
17	1,109	56.35%	364,229	93.77%	863	53.87%	347,933	93.77%
34	863	43.85%	347,752	89.53%	685	42.76%	332,656	89.65%
51	751	38.16%	334,149	86.03%	581	36.27%	320,103	86.27%
68	687	34.91%	321,999	82.90%	530	33.08%	308,982	83.27%
85	626	31.81%	310,855	80.03%	501	31.27%	298,691	80.50%
97	600	30.49%	303,089	78.03%	478	29.84%	291,358	78.52%
127	540	27.44%	286,248	73.70%	450	28.09%	275,147	74.15%
148	520	26.42%	275,059	70.81%	434	27.09%	264,138	71.18%
169	491	24.95%	264,323	68.05%	421	26.28%	253,401	68.29%
212	467	23.73%	244,086	62.84%	396	24.72%	232,984	62.79%
254	434	22.05%	225,005	57.93%	379	23.66%	213,594	57.56%
339	371	18.85%	190,772	49.11%	326	20.35%	178,418	48.08%
424	329	16.72%	161,043	41.46%	273	17.04%	148,386	39.99%
508	273	13.87%	135,555	34.90%	230	14.36%	123,193	33.20%
593	238	12.09%	113,971	29.34%	194	12.11%	101,851	27.45%
678	209	10.62%	94,916	24.44%	162	10.11%	84,068	22.66%
763	172	8.74%	79,055	20.35%	130	8.11%	69,370	18.70%
847	141	7.16%	65,870	16.96%	110	6.87%	57,257	15.43%
932	121	6.15%	54,757	14.10%	93	5.81%	46,907	12.64%
1,017	105	5.34%	45,127	11.62%	74	4.62%	38,569	10.39%
1,102	89	4.52%	36,829	9.48%	64	4.00%	31,666	8.53%
1,186	73	3.71%	29,879	7.69%	51	3.18%	25,846	6.97%
1,271	59	3.00%	24,194	6.23%	43	2.68%	21,129	5.69%
1,356	52	2.64%	19,531	5.03%	34	2.12%	17,290	4.66%
1,441	46	2.34%	15,391	3.96%	25	1.56%	14,381	3.88%
1,525	36	1.83%	11,789	3.04%	20	1.25%	12,143	3.27%
1,610	29	1.47%	8,978	2.31%	19	1.19%	10,178	2.74%
1,695	22	1.12%	6,862	1.77%	16	1.00%	8,359	2.25%

1,907	14	0.71%	3,169	0.82%	9	0.56%	5,219	1.41%
2,119	5	0.25%	1,168	0.30%	6	0.37%	3,032	0.82%
2,331	2	0.10%	671	0.17%	4	0.25%	1,820	0.49%
2,542	1	0.05%	411	0.11%	4	0.25%	820	0.22%
2,754	1	0.05%	199	0.05%	1	0.06%	302	0.08%
2,966	0	0.00%	0	0.00%	1	0.06%	52	0.01%

The Council considered separate trip limits for the pot and hook and line fisheries at their September 2010 meeting (See **Appendix A**). Because black sea bass are predominately taken with pots (**Table 4-1**), the Council determined establishing trip limits for the hook and line component of the fishery would have little impact on extending the black sea bass pot fishery.

Alternatives 3 (Preferred)-6 include alternatives, which could modify the fishing year and establish a split season commercial quotas for black sea bass based on historical proportions of landings. A**lternatives 3 (Preferred)** and **4** would retain the current June-May fishing year for black sea bass and establish two six month commercial quotas based on data from 2006-2009 (**Table 4-6a**). Under **Alternative 3 (Preferred)**, the second portion of the fishing season would begin in December when fish houses usually shut for Christmas (Tom Burgess, pers.com.). Based on estimated data, which takes into consideration increased effort for the June 2009-May 2010 fishing year, the quota for the June-November portion of fishing year would be met in September and the quota for the December-May portion of the fishing year would be met in January during the 2009 fishing year (**Table 4-6a**).

For **Alternative 4**, the first portion of the commercial fishing season would extend through the month of December with the second half beginning in January. **Alternative 4** would divide the quota more evenly among the two time periods and could be better economically for fishermen. It is estimated the commercial quota for June-December would be met in October and the commercial quota for January-May would be met in January during the 2009 fishing year.

Alternative 5 would change the fishing year to November-October and divide the commercial fishing season into November-April and May-October. The commercial quota would be apportioned into seasons based on average landings from 2006-2009 (**Table 4-6a**). Based on estimated data for the 2009 fishing year, the November-April quota would be met in January and the May-October quota would be met in August for the 2009 fishing year. **Alternative 6** would change the fishing year to January-December and proposes splitting the commercial season into January-June and July-December. The expected dates that the quota would be met, when increased effort during the 2009 fishing year is considered, would be during February for the January-June portion of the 2009 fishing year and October for the July-December portion of the 2009 fishing year.

Table 4-6a. ACL (quota in pounds gutted weight) for split seasons for **Alternatives 1 and 3-6** based on proportion of average landings during fishing years for 2006-2009. Expected date quota would be met for the 2009-2010 and average of 2006-2010 fishing years.

	Alternative 1	Alternative 3 Preferred		Alternative 4		Alternative 5		Alternative 6	
	June-May	June-Nov	Dec-May	June-Dec	Jan-May	Nov-April	May-Oct	Jan-June	July-Dec
ACL (quota)	309,000	128,547	180,453	176,945	132,055	211,024	97,976	151,338	157,662
2009-2010	20-Dec	15-Sep	29-Jan	15-Oct	18-Jan	26-Jan	21-Aug	8-Feb	24-Oct
average	4-Feb	13-Nov	14-Feb	11-Dec	18-Feb	7-Feb	29-Sep	13-Mar	13-Dec

Splitting the harvest season into two components under **Alternatives 3 (Preferred)-6** (as was done for vermilion snapper in Amendment 16 (SAFMC 2009a), would allow commercial black sea bass fishermen to capitalize on the resources over a longer period of time, rather than in one compressed season. Establishing two commercial fishing seasons would ensure the fishery two distinct opportunities for harvest.

Alternatives 3 (Preferred)-6 would not set a trip limit so there would not be a problem with fishermen unexpectedly exceeding the trip limit and having to release black sea bass from pots, which could result in some discard mortality. Given the current level of fishing pressure, the quotas would be expected to be met early during each fishing season for the four alternatives (**Table 4-6a**). This would result in periods of time of no fishing for black sea bass with pots, which would have a positive biological effects for black sea bass, which is overfished and in a rebuilding plan as well as protected species that have the potential of becoming entangled in pot lines.

Furthermore, an early closure during December-May under **Alternative 3 (Preferred)**, January-May under **Alternative 4**, November-April under **Alternative 5**, and January-June under **Alternative 6** would protect black sea bass when they are in spawning condition. McGovern *et al.* (2002) indicate black sea bass females in the South Atlantic are in spawning condition during March-July, with a peak during March through May (**Figure 4-1**) and Sedberry *et al.* (2006) state peak spawning is during February-April in the same area. While **Alternative 5** would help to maintain the winter commercial fishery for the black sea bass and provide some relief from the developing derby conditions, a May 1 start for the second half of the fishing year could result in substantial fishing occurring during a portion of peak spawning.

Due to the reduced quota of 309,000 pounds gutted weight, the black sea bass fishery closed during December 2009 and October 2010. Opening black sea bass during November, December, and January under **Alternatives 3 (Preferred)-6** could increase the possibility of entanglement with right whales relative to recent landings since this is the time of year when they may occur off the South Atlantic states. However, the chance of interaction with protected species associated with **Alternatives 3 (Preferred)-6** is expected to be less than during years prior to the 2009-2010 and 2010-2011 due to reduced effort associated with the reduced quota of 309,000 pounds gutted weight implemented through Amendment 13C.

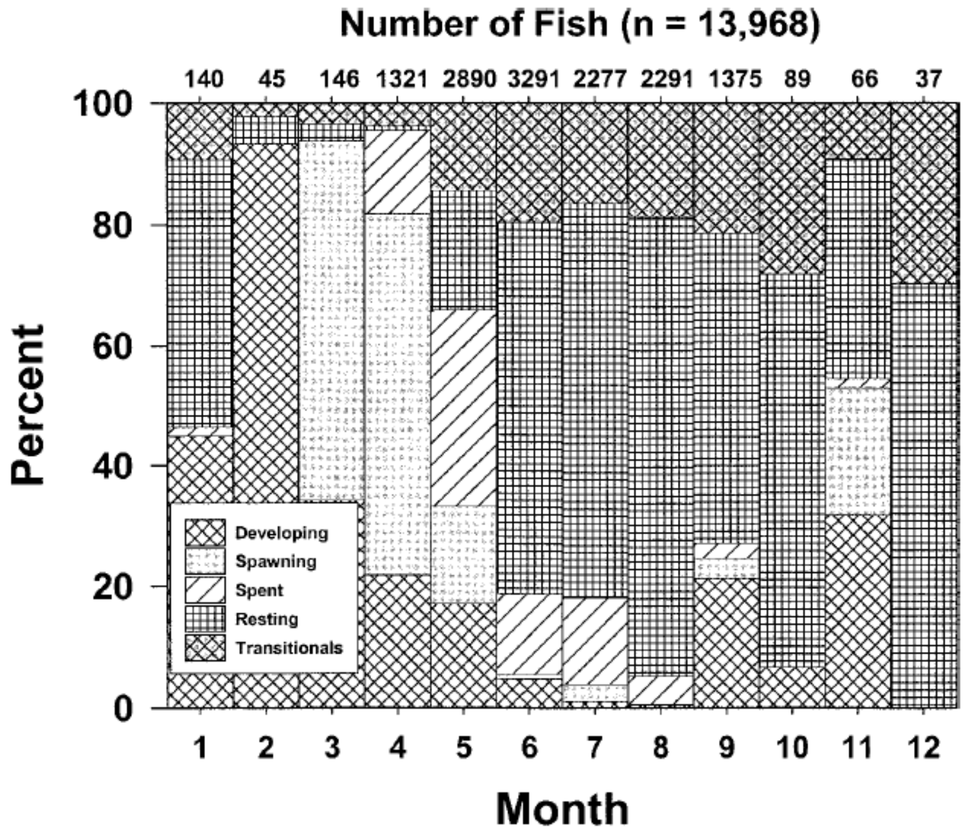


FIGURE 4.—Monthly gonadal stage percentages for 13,968 female black sea bass captured between 31°20′N and 34°00′N, 1978–1998. The number collected and examined each month is given at the top of the bar.

Figure 4-1. Black sea bass spawning information from McGovern *et al.* (2002).

Changing the fishing year in **Alternatives 5 and 6** would affect the time when the recreational ACL would be expected to be met. Under **Alternatives 3 (Preferred)** and **4**, which would not change the fishing year, it is expected that the 409,000 pounds gutted weight recreational ACL put in place through Amendment 17B (SAFMC 2010b) would be met just prior to peak spawning of black sea bass (**Table 4-6b**). Under **Alternative 5**, which would start the fishing year in November, it is expected the recreational ACL would be met in July, and the recreational ACL would be expected to be met in August for a January start date (**Alternative 6**). Therefore, for the recreational sector, retaining the June start date in **Alternatives 3 (Preferred)** and **4** would have a greater biological effect for black sea bass than changing the fishing year start date to November (**Alternative 5**) or January (**Alternative 6**).

Table 4-6b. Average cumulative recreational landings (pounds gutted weight) of black sea bass during 2006-2009 for fishing year start dates maintained in Alternatives 3 and 4 (June), proposed in Alternative 5 (November) and proposed in Alternative 6 (January).
Shaded area indicates month when 409,000 pounds gutted weight recreational ACL is expected to be met.

Current Fishing Year		Nov start date		Jan start date	
Month	**Landings**	**Month**	**Landings**	**Month**	**Landings**
6	86,313	11	48,900	1	19,800
7	156,527	12	97,228	2	39,788
8	222,493	1	117,027	3	85,369
9	249,037	2	137,016	4	136,498
10	274,908	3	182,596	5	209,218
11	323,807	4	233,726	6	295,532
12	372,136	5	306,446	7	365,746
1	391,935	6	392,760	8	431,712
2	411,924	7	462,974	9	458,255
3	457,504	8	528,939	10	484,126
4	508,634	9	555,483	11	533,026
5	581,354	10	581,354	12	581,354

Alternative 7 (Preferred) would allow an unused portion of a quota during the first part of a fishing season to be used in the second portion of the same season. This option is used for the split season for vermilion snapper. **Alternative 8** would allow an unused portion of a quota during the second portion of a fishing season to be used during the next fishing year. Adding the unused portion of the ACL (quota) to the following fishing could result in the ACL for the following portion of the fishing year to be exceeded and trigger AMs. Furthermore, if the amount of quota carried forward was large enough, the ABC or OFL could be exceeded and the fishery would be considered to be experiencing overfishing. Therefore, while it is feasible to carry forward an unused portion of a quota from the first part of a fishing year into the second, there are problems associated with carrying quota into a new fishing year. Any reduction of harvest would have increased biological effects and would enhance rebuilding of black sea bass.

Alternative 9 would prohibit harvest of black sea bass with pots under the fishing year scenarios described under **Alternatives 3 (Preferred)-6** when all but 100,000 pounds gutted weight is projected to be landed but would allow harvest of black sea bass with allowable gear types to continue. Harvest of black sea bass with pots would begin again during second part of the fishing season specified in **Alternatives 3 (Preferred)-6**, and would continue until the ACL (quota) is met. **Alternative 9** would be expected to result in early closures when applied to **Alternatives 3 (Preferred)-6** (**Table 4-7a**). Based on data from the 2009-2010 fishing year (**Table 4-7b**), closures during March-May peak spawning for black sea bass would be expected under **Alternative 3 (Preferred)**, **4,** and **6**. The closure dates identified in **Table 4-7a** assumes elevated effort that has occurred recently. Quotas would not be met as quickly if effort returned to levels in previous years as portrayed by landings shown in **Table 4-7c**. **Alternative 5** could allow fishing to occur during the May portion of peak spawning.

Table 4-7a. Expected quotas and date when quotas would be met during the 2009-2010 fishing year under Alternative 9 for the fishing seasons proposed under Alternatives 3-6.

	Alternative 3 Preferred		Alternative 4		Alternative 5		Alternative 6	
Fishing year	**June-Nov**	**Dec-May**	**June-Dec**	**Jan-May**	**Nov-Apr**	**May-Oct**	**Jan-June**	**July-Dec**
Expected Pot Catch	184,630	82,803	184,630	92,954	192,686	68,167	201,715	65,473
Expected H&L catch	30,662	4,212	30,662	2,865	31,488	16,521	26,878	10,014
Date all but 100,000 pounds met	10-Nov		10-Nov		12-Jan		18-Feb	
Date quota met		5-Jan		25-Jan		13-Aug		3-Sep

Table 4-7b. Estimated commercial landings (pounds gutted weight) of black sea bass during the 2009-2010 fishing year.
Data for December 2009-May 2010 are simulated based on increased effort **(Table 4-2)**.
Other gear is primarily hook and line. NMFS Logbook.

Month	Pots	Other	Total
6	26,785	5,996	32,781
7	23,969	4,914	28,884
8	34,838	4,907	39,745
9	47,928	3,852	51,780
10	37,954	3,592	41,546
11	44,912	7,401	52,313
12	58,747	3,206	61,952
1	124,518	3,667	128,185
2	114,853	5,267	120,120
3	57,684	4,034	61,718
4	29,689	4,323	34,012
5	3,499	3,592	7,091

Table 4-7c. Average commercial landings (pounds gutted weight) of black sea bass during the 2006-2007 to 2008-2009 fishing years.
NFMS Logbook.

Month	Pots	Other	Total
6	11,249	3,568	14,817
7	7,479	2,872	10,351
8	9,676	2,955	12,631
9	4,244	1,648	5,892
10	15,847	1,824	17,672
11	38,646	2,777	41,423
12	64,710	5,137	69,847
1	68,143	3,630	71,773
2	59,423	3,994	63,417
3	40,927	3,382	44,309
4	18,615	3,293	21,908
5	7,905	3,694	11,599

Alternative 10 would prohibit harvest of black sea bass with pots under **Alternatives 3 (Preferred)-6** when all but 50,000 pounds gutted weight is projected to be landed but would allow harvest of black sea bass with allowable gear types to continue. Harvest of black sea bass with pots would begin again during second part of the fishing specified in **Alternatives 3 (Preferred)-6**, and would continue until the quota is met. **Alternative 10** would be expected to result in early closures when applied to **Alternatives 3 (Preferred)-6** (**Table 4-8**). Closures during March-May peak spawning for black sea bass would be expected under **Alternative 3 (Preferred)** and **Alternative 4**. **Alternatives 5** and **6** could allow fishing to occur during the May and March portions of peak spawning, respectively.

Table 4-8. Expected quotas and date when quotas would be met during the 2009-2010 fishing year under Alternative 10 for the fishing seasons proposed under Alternatives 3 (Preferred)-4.

	Alternative 3 Preferred		Alternative 4		Alternative 5		Alternative 6	
Fishing year	June-Nov	Dec-May	June-Dec	Jan-May	Nov-Apr	May-Oct	Jan-June	July-Dec
Expected Pot Catch	226,746	43,166	226,746	44,459	241,440	27,142	248,307	23,969
Expected H&L catch	30,662	3,169	30,662	1,728	31,488	8,984	26,878	4,930
Date all but 50,000 pounds met	9-Dec		9-Dec		27-Jan		6-Mar	
Date quota met		26-Dec		10-Jan		28-Jun		1-Aug

Alternative 11 would close the pot fishery when 90% of the commercial quota is met and allow other gear types to be used until the quota is met. Historically, approximately 90% of the black sea bass harvest has been taken with pots. Landings on trips where hook and line gear is used is very small (**Table 4-1**). Fishermen are able to target black sea bass with pots; however, black

sea bass are more likely incidental catch when fishermen use hook and line gear to target co-occurring species. Therefore, **Alternative 11** would be expected to reduce bycatch mortality of black sea bass to some degree by allowing a small harvest of black sea bass after the majority of the quota has been harvested with pot gear.

McGovern *et al.* (2002) report that the greatest percentage of black sea bass females in spawning condition in the South Atlantic occur during March through May (**Figure 4-1**). **Alternatives 1-11** would not implement a spawning season closure for black sea bass. However, a spawning season closure (**Alternative 12**) could provide black sea bass with more spawning opportunities, which could contribute to recruitment success of a new year-class, help rebuild the stock more quickly, and result in a more stable and sustainable resource. It is noted that the current regulations implemented through Amendment 13C have resulted in a commercial closure of black sea bass during the peak spawning season as the commercial quota for the June 1 2009-May 31 2010 fishing year was met in December 2009. However, a change in the fishing year is being considered in this amendment to relieve derby conditions that may be occurring resulting in the quota being met very quickly, which could result in fishing during the peak spawning season.

Sub-Alternatives 12a-12d would consider alternatives for various spawning season closures for the commercial and recreational sectors. However, in consideration of **Sub-Alternatives 12a-12d**, it should be noted that there is evidence of a cline in peak spawning of black sea bass with spawning occurring earlier in the year in the more southern latitudes. Hood *et al.* (1994) report 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 (**Figure 4-1**). Sedberry *et al.* (2006) states 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 (**Figure 4-1**) 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.

Sub-Alternatives 12a-12d would establish various combinations of the peak spawning months reported by reported by McGovern *et al.* (2002). **Sub-Alternative 12a** would establish a March 1-April 30 spawning season closure. This alternative would encompass a larger portion of the March-May peak spawning season for black sea bass than **Sub-Alternatives 12b and 12c**. Furthermore, **Sub-Alternative 12a** would likely have a greater biological benefit for black sea bass off of Florida and Georgia than subalternatives that would close black sea bass later during the spawning season if spawning occurs earlier in the more southern latitudes. March and April accounted for 15% of black sea bass landings during the 2006-2009 fishing year. **Sub-Alternative 12b**, which would close the months of April and May, would not have as great a biological benefit as **Sub-Alternative 12a** because it would not include the month of March when a large proportion of the population is in spawning condition. However, **Sub-Alternative 12b** would likely have a greater biological benefit for black sea bass off of North Carolina than **Sub-Alternative 12a**, which would close the months of March and April. April and May accounted for 16% of the total landings during the 2006-2009 fishing year but only 8% of the commercial sector occurred during those months (**Table 4-9**). Most commercial landings have historically occurred during November through February. The biological benefit of **Sub-Alternative 12c** would be greatest of all the alternatives considered because it would encompass the March-May period of peak spawning when all information for the South Atlantic is considered (McGovern *et al.* 2002). The biological benefit of **Sub-Alternative 12d** would be least of the action alternatives because it would only close May when a small proportion of the population is in spawning condition relative to March and April. Only a small portion (3%) of the commercial landings occurred during May during the 2006-2009 fishing years (**Table 4-9**). Furthermore, only **Sub-alternative 12d** would be expected to have the least amount of biological benefit for black sea bass off Florida and Georgia if there is a seasonal progression in spawning from south to north. Thus, in terms of biological benefit to black sea bass, the order of sub-alternatives from greatest benefit to least is: **Sub-Alternative 12c; Sub-Alternative 12a; Sub-Alternative 12b;** and **Sub-Alternative 12d**.

Table 4-9. Percentage of monthly landings for black sea bass during 2006-2009 fishing years.

Month	MRFSS	HB	Comm	Total
6	15%	15%	6%	11%
7	11%	15%	5%	9%
8	11%	11%	6%	9%
9	4%	7%	5%	5%
10	4%	6%	7%	5%
11	10%	4%	13%	10%
12	10%	4%	16%	11%
1	4%	3%	14%	7%
2	4%	3%	12%	7%
3	8%	8%	8%	8%
4	8%	12%	5%	7%
5	13%	12%	3%	9%

Data for the January-May 2010 portion of the 2009 are estimated as the average of the 4 preceding years for MRFSS and Headboat (HB) and assumed to be 0 for the commercial sector because the quota was met on December 20, 2010.

Alternative 13 and its sub-alternatives would reduce the recreational bag limit to a level that would provide the reduction in harvest needed to prolong the black sea bass recreational fishing season. The intent of **Alternative 13** is to increase the social and economic benefits associated with extending the season without having negative biological effects on the black sea bass stock. Adjusting the bag limit would not be expected to have negative biological effects on the stock. Biological protection for the black sea bass stock is provided by the ACL.

An estimated 33% reduction in harvest would be needed to prevent the recreational ACL from being met in the 2010/2011 fishing year (**Table 4-10**). **Table 4-11** shows the cumulative landings by month for the various fishing years and when the recreational ACL would be expected to be met. To show what landings might have been without the closure during the June 2010 to May 2011 fishing year, data from January-May 2011 were assumed to equal the average landings for the past three years. This estimate was necessary to determine what reduction in harvest would be needed to prevent the ACL from being met. Analysis does not consider release mortality or non-compliance because the purpose of the alternative is to reduce harvest, not fishing mortality. It is also noted that the ACL is based on landed catch and does not include estimates of dead discards.

Table 4-10. Comparison of landings and recreational ACL.

Fishing Year	Total	Total gw	Percent Reduction Needed to Achieve ACL
2008/2009	520,371	440,992	7%*
2009/2010	574,332	486,722	16%*
2009/2010	657,586	557,276	27%**
2010/2011	724,103	613,647	33%***

*Based on data provided by Science Center in December 2010.
**Includes updated MRFSS data obtained on February 24, 2011.
***Assumes landings during January-May 2011 are the same as average during three previous years.

Table 4-11. Estimated month ACL would have been met by fishing year.

Month	2007/08*	2008/09	2009/10	2010/11
June	96,878	59,620	43,317	98,152
July	192,644	96,303	99,968	157,785
August	281,981	131,504	150,159	213,156
September	298,315	151,560	176,520	280,472
October	315,219	171,293	200,593	355,623
November	357,106	229,522	225,081	384,066
December	399,635	286,224	250,375	407,755
January	415,744	312,056	281,235	432,023
February	433,390	338,167	313,500	457,363
March	463,592	368,814	385,804	501,747
April	496,073	404,227	470,470	552,601
May	555,638	440,992	557,276	613,647
Percent Over ACL	None	7%	27%	33%

*Recreational ACL in 2007/2008 was 560,000 pounds gutted weight. Note: Landings from January-May are estimated as average of previous three years. Landings were estimated to determine what bag limit would be needed to extend fishing season.

Based on data from the 2008/2009 to the 2010/2011 fishing years, a reduction in the bag limit from 7 to 3 fish per person would be needed to prevent the recreational ACL from being met when compared to a bag limit analysis using data from 2007-2009 (**Table 4-12a**) and 2010 (**Table 4-12b**).

Table 4-12a. Reduction in harvest of black sea bass provided by reduction in the bag limit. Based on data from NC to FL during 2007-2009 calendar years.

Bag Limit	Headboat	Charter	Private	All sectors
15	0%	0%	0%	0.00%
14	0%	1%	0%	0.21%
13	1%	1%	0%	0.48%
12	1%	3%	0%	0.73%
11	3%	4%	1%	1.61%
10	3%	6%	1%	2.08%
9	4%	8%	2%	3.22%
8	6%	10%	3%	4.53%
7	8%	13%	5%	6.31%
6	11%	15%	7%	8.80%
5	14%	20%	10%	12.22%
4	19%	26%	15%	17.18%
3	25%	35%	23%	24.53%
2	34%	49%	35%	36.56%
1	51%	69%	56%	56.56%

Table 4-12b. Reduction in harvest of black sea bass provided by reduction in the bag limit. Based on data from NC to FL during 2010 calendar year.

Bag Limit	Headboat	Charter	Private	All sectors
15	0%	0%	0%	0.00%
14	0%	1%	0%	0.43%
13	1%	1%	0%	0.92%
12	1%	3%	0%	1.56%
11	3%	4%	1%	2.71%
10	3%	6%	1%	3.71%
9	4%	8%	2%	5.30%
8	6%	10%	3%	7.07%
7	8%	13%	5%	9.18%
6	11%	15%	7%	11.74%
5 (Preferred)	**14%**	**20%**	**10%**	**15.53%**
4	19%	26%	15%	21.30%
3	25%	35%	23%	29.34%
2	34%	49%	35%	42.14%
1	51%	69%	56%	62.05%

Table 4-12c shows that the reduction provided by a given bag limit is less as one moves from 2007 to 2009. This could be a function of a recovering stock where more trips are successful, and there is an increase in the overall catch of fish in the 1 to 2 fish range. If this trend were to continue, it is possible the bag limit needed to prolong the season without meeting the ACL would be lower than implied by combined data from 2007-2009 in **Table 4-12c**. Alternatively, as shown for 2010 in **Table 4-12c**, it could also be expected that as stock biomass further increases and more black sea bass achieve sizes above the minimum size limit of 12 inches TL, the average catch per person could increase.

Table 4-12c. Reduction in harvest of black sea bass provided by reduction in the bag limit. Based on data from 2007-2009 and 2010.

Bag limit	2007	2008	2009	2007-2009	2010
15	0.0%	0.0%	0.0%	0.00%	0.0%
14	0.3%	0.1%	0.1%	0.21%	0.4%
13	0.6%	0.2%	0.2%	0.48%	0.9%
12	1.0%	0.3%	0.4%	0.73%	1.6%
11	2.0%	0.9%	1.1%	1.61%	2.7%
10	2.5%	1.4%	1.4%	2.08%	3.7%
9	3.7%	2.0%	2.2%	3.22%	5.3%
8	5.2%	2.7%	3.1%	4.53%	7.1%
7	7.2%	3.7%	4.1%	6.31%	9.2%
6	9.9%	5.6%	6.5%	8.80%	11.7%
5 (Preferred)	**13.6%**	**8.6%**	**9.3%**	**12.22%**	**15.5%**
4	18.8%	13.8%	13.2%	17.18%	21.3%
3	26.4%	21.7%	20.0%	24.53%	29.3%
2	38.6%	34.4%	30.7%	36.56%	42.1%
1	58.2%	56.5%	48.9%	56.56%	62.0%

Table 4-13 shows when the 409,000 pound ACL would be expected to be met if the bag limit was reduced to 7 to 1 fish per person per day based on reductions in bag limit estimated from using data from 2007-2009. Using data from 2010 shows the ACL would be met later in the fishing year because a greater reduction in harvest would be provided by a reduction in the bag limit (**Table 4-14**).

Table 4-13. Estimated date 409,000 pounds gutted weight ACL would be met based on various bag limit reductions for different fishing years based on bag limit reduction estimates using data from 2007-2009.

Year	Bag 15	Bag 7	Bag 5 (Preferred)	Bag 3	Bag 2	Bag 1
2008/09	4-May	27-May	not met	not met	not met	not met
2009/10	8-Apr	18-Apr	28-Apr	25-May	not met	not met
2010/11	1-Jan	5-Feb	6-Mar	24-Apr	not met	not met

Table 4-14. Estimated date 409,000 pounds gutted weight ACL would be met based on various bag limit reductions for different fishing years based on bag limit reduction estimates using data from 2010.

Year	Bag 15	Bag 7	Bag 5 (Preferred)	Bag 3	Bag 2	Bag 1
2008/09	4-May	not met	not met	not met	not met	not met
2009/10	8-Apr	23-Apr	5-May	not met	not met	not met
2010/11	1-Jan	20-Feb	19-Mar	13-May	not met	not met

The Council is also considering a spawning season closure in **Alternative 12** of Regulatory Amendment 9. The adoption of a spawning closure would reduce the extendable period of the season from one to three months, thereby reducing the potential severity of any reduction in the bag limit. Overlap of the two alternatives – a spawning closure to improve biological health and a reduction in the bag limit to extend the season – requires consideration of the trade-offs of improved stock conditions versus increased fishing opportunities. Based on data from 2008/2009 to 2009/2010 fishing years sub-alternatives under **Alternative 12** that close the fishing season from two to three months would be expected to provide the reduction in harvest needed to prevent the ACL being met and therefore, no bag limit reduction would be required. However, based on data from the 2010/2011 fishing year, a spawning season closure alone would not be sufficient to prevent the ACL from being met (**Table 4-15**).

Table 4-15. Reduction in harvest needed to prevent recreational ACL from being met based on spawning season closure sub-alternatives proposed in Alternative 12.
Negative sign in front of value indicates ACL would not be met and no reduction in bag limit would be needed.

Fishing year	March-April	April-May	March-May	May	No Closure
2008/2009	-9%	-11%	-21%	-1%	7%
2009/2010	-2%	-6%	-30%	13%	27%
2010/2011	21%	18%	11%	26%	33%

Alternative 1 (No Action) could have a greater biological effect than any of the action sub-alternatives since the status quo would be more likely to result in the longest seasonal closure. A long seasonal closure in combination with seasonal closures for shallow water grouper and vermilion snapper could result in cancellation of fishing trips thereby providing an increased biological effect for black sea bass and other snapper grouper species. The status quo is also the most likely alternative to provide protection for black sea bass during peak spawning (March-May) off the South Atlantic states. Sub-alternatives that reduce the bag limit and extend the recreational fishing season for black sea bass could decrease the biological benefit for black sea bass because they could potentially increase bycatch mortality. However, the status quo and spawning season closures could also result in increased bycatch of black sea bass when fishermen target co-occurring species and discard incidentally caught black sea bass. As release mortality is estimated to be low (15%) for black sea bass, the negative biological effects associated with decreasing the bag limit is expected to be minimal (SEDAR 2 Assessment Update).

Therefore, the biological effects of the different sub-alternatives are expected to be similar. As discussed in the following sections, the greatest effect of the sub-alternatives will be to increase the social and economic benefits associated with extending the season rather than improve the biological condition of black sea bass.

Alternative 1 (No Action) will likely perpetuate the existing level of risk for interactions between ESA-listed species and the fishery. **Alternatives 2** through **12** are unlikely to have adverse effects on listed *Acropora* species. Black sea bass pots are prohibited south of St. Lucie Inlet, Florida. The northern extent of *Acroporas'* range in Florida is West Palm Beach, south of the black sea bass trapping boundary. Because the range of *Acropora* and the black sea bass pot fishery do not overlap, black sea bass pots will not interact with *Acropora* colonies. Previous ESA consultations determined the hook-and-line sector of the snapper grouper fishery was not likely to adversely affect *Acropora* species. These alternatives are unlikely to alter fishing behavior in a way that would cause new adverse effects to these species.

The impacts to protected species from **Alternative 2** and its sub-alternatives, **Alternatives 7 (Preferred), 8, 9, 10, 11**, **12,** and **Alternative 13** and its sub-alternatives are uncertain. If these alternatives ultimately reduce overall fishing effort, then the risk of interactions between protected resources and the fishery will likely be reduced. However, if these alternatives result in an effort shift and not an actual effort reduction, then the alternatives are unlikely to reduce the risk of adverse effects to protected species from interactions with the fishery.

The impacts of **Alternatives 5** and **6** on sea turtles and smalltooth sawfish are unclear. If these alternatives ultimately reduce overall fishing effort, then the risk of interactions between these species and the fishery will likely be reduced. However, if these alternatives result in an effort shift and not an actual effort reduction, then the alternatives are unlikely to reduce the risk of adverse effects to these species from interactions with the fishery.

ESA-listed large whales migrate up and down the East Coast annually. Peak migrations from North Atlantic right whales occur once in the winter (November/December) and once in spring (March/April). During the winter migration, animals move from northern feeding ground off New England to calving grounds off Florida/Georgia. Migration begins again in the spring when mothers and newly born calves leave the southern calving grounds to return to the northern feeding grounds. North Atlantic right whales are especially susceptible to entanglement in vertical buoy lines and buoyant groundlines. Humpback whales are also known to occur off of the South Atlantic states, particularly North Carolina, during the winter months. Based on past fishing behavior, maintaining the current fishing year but specifying a separate ACL for June-November and December-May (**Preferred Alternative 3**) or June-December and January-May (**Alternative 4**), will likely lead to an increased number of traps in the water at the beginning of each season. Increased fishing effort, particularly during December and January, is likely o increase the risk of entanglements for ESA-listed large whales occurring off the South Atlantic at this time of year. Changing the black sea bass season to November-October (**Alternative 5**) is also likely to lead to an increased number of traps in the water at the very time ESA-listed large whales begin to migrate through the area; increasing the potential for interactions with the fishery. **Alternative 6** may be slightly more beneficial to ESA-listed large whales. Delaying the start of the fishing season may allow some ESA-listed large whales to migrate without encountering black sea bass pots. However, if animals delay their migration the potential negative impacts to ESA-listed large whales from **Alternatives 5** and may be very similar.

4.1.2 Economic Effects

Alternative 2 proposes a number of different trip limits for black sea bass. **Table 4-16** shows the amount of dockside revenues foregone as a result of **Sub-Alternatives 2a-2h** based on trips, landings and dockside revenues from 2007-2009 using a three year average. The analysis applies the trip limits proposed here to 2007-2009 landings. The analysis assumes that once the trip limits proposed here are reached for each trip, the vessel will stop fishing. Any landings made in excess of the trip limit is tallied as a loss and converted into 2009 dollars.

Using this methodology, short-term economic effects of the trip limits were made in the form of ex-vessel revenues. This analysis cannot account for the fact that vessels may make more trips as a result of a smaller trip limit. However, fishermen, who are able to, are likely to make more trips in order to maintain current landings and profit levels. So, the results listed in **Table 4-16** could be an overestimation of ex-vessel revenue losses. In general, for boats that bring in relatively larger landings per trip, ex-vessel revenue losses are expected to occur. If a boat with historically larger landings adheres to the trip limit and does not increase the number of trips made, landings by these vessels will decrease compared to current landings as will ex-vessel revenues. Boats that bring in smaller landings per trip may or may not be impacted by the trip limits proposed. Boats that have not historically landed the proposed trip limits will not experience ex-vessel revenue losses. Others will likely reach the proposed trip limits and either experience revenue losses or make additional trips to increase landings. While additional trips will increase ex-vessel revenues, they will also increase costs and decrease net revenues (or profits). While some vessels may be able to increase their trips and net revenues, others will not be able to do so because they are too far from the fishing grounds to make additional trips worthwhile or costs are high enough to deter additional trips.

Sub-Alternative 2h (340 pounds gw trip limit) has the largest short-term negative economic effects in the form of foregone dockside revenues while **Sub-Alternative 2a** has the second largest negative effect. **Sub-Alternatives 2b, 2e, 2c, 2d, 2f,** and **2g** have the next largest economic losses in descending order (**Table 4-16**). In general, the smaller the trip limit, the larger the economic losses. However, smaller trip limits could have some economic benefit in that fish houses and dealers would possibly be able to maintain some supply for a longer period of the season and could possibly receive higher prices for their product since the market would not be flooded with an excess of black sea bass over a short period of time. The benefits to fishermen, however, are probably negative, as explained in the above paragraph. Without making additional trips, fishery wide ex-vessel revenues will decrease, as will profit levels. If fishermen who are able to, make additional trips, their costs will increase making increasing profit levels harder than under **Alternative 1 (No Action)**. If we assume that fishermen under current conditions are maximizing their profitability, then trip limits will certainly lead to profit losses for the fishery as a whole. These profit losses cannot be estimated unfortunately because cost data exists for the snapper grouper fishery as a whole and does not exist for vessels that target specific species, like black sea bass.

Table 4-16. Dockside revenues foregone as a result of Alternatives 2a-2h based on 2007-2009 average landings data.

Alternative	Total revenue loss in 2009 dollars (ex-vessel revenue)
Alternative 1 (No Action)	$0
Alternative 2a (500 pounds gw)	$351,000
Alternative 2b (750 pounds gw)	$198,000
Alternative 2c (1,000 pounds gw)	$112,000
Alternative 2d (1,250 pounds gw)	$60,000
Alternative 2e (1000 pounds gw reduced to 500 pounds gw when 75% of quota met)	$181,000
Alternative 2f (2,000 pounds gw)	$7,000
Alternative 2g (2,500 pounds gw)	$1,000
Alternative 2h (340 pounds gw)	$499,000

Sub-Alternatives 2a-2h would impact different gear groups differently. **Table 4-17** shows the dockside revenues foregone as a result of **Sub-Alternatives 2a-2h** for pot and hook and line gear users. As the trip limit increases, dockside revenue losses decrease.

Table 4-17. Dockside revenues foregone as a result of Alternatives 2a-2h based on 2007-2009 average landings data by gear for black sea bass.

Alternative	Pot Gear - Total revenue loss in 2009 dollars (ex-vessel revenue)	Hook and Line - Total revenue loss in 2009 dollars (ex-vessel revenue)
Alternative 1 (No Action)	$0	$0
Alternative 2a (500 pounds gw)	$343,000	$8,000
Alternative 2b (750 pounds gw)	$194,000	$4,000
Alternative 2c (1,000 pounds gw)	$110,000	$2,000
Alternative 2d (1,250 pounds gw)	$60,000	$1,000
Alternative 2e (1000 pounds gw reduced to 500 pounds gw when 75% of quota met)	$110,000	$6,000
Alternative 2f (2,000 pounds gw)	$7,000	$0
Alternative 2g (2,500 pounds gw)	$1,000	$0
Alternative 2h (340 pounds gw)	$486,000	$13,000

With regard to short-term economic effects by state, **Table 4-18** shows dockside revenue losses by state. The table indicates that revenue losses will be experienced primarily in North Carolina and South Carolina with some impacts in Georgia and Northeast Florida. As expected, in general, the higher the trip limit, the smaller the revenue loss.

Table 4-18. Dockside revenues foregone as a result of Alternatives 2a-2h based on 2007-2009 average landings data, by state for black sea bass.
All values are in 2009 dollars.

Alternative	North Carolina	South Carolina	Georgia and Northeast Florida	Southeast Florida	Florida Keys
Alternative 1 (No Action)	$0	$0	$0	$0	$0
Sub-Alternative 2a (500 pounds gw)	$227,000	$114,000	$10,000	$0	$0
Sub-Alternative 2b (750 pounds gw)	$132,000	$61,000	$6,000	$0	$0
Sub-Alternative 2c (1,000 pounds gw)	$78,000	$31,000	$3,000	$0	$0
Sub-Alternative 2d (1,250 pounds gw)	$45,000	$13,000	$2,000	$0	$0
Sub-Alternative 2e (1,000 pounds gw reduced to 500 pounds gw when 75% of quota met)	$115,000	$52,000	$5,000	$0	$0
Sub-Alternative 2f (2,000 pounds gw)	$7,000	$0	$1,000	$0	$0
Sub-Alternative 2g (2,500 pounds gw)	$1,000	$0	$0	$0	$0
Sub-Alternative 2h (340 pounds gw)	$323,000	$164,000	$13,000	$0	$0

The expected date at which the quota would be met over various periods of time for **Alternatives 3 (Preferred)-6** is shown in **Table 4-7a**. In general, a split season could have commercial economic benefits in that it would allow for two fishing opportunities that could extend the season, break up derby fishing, and perhaps result in higher ex-vessel prices paid to fishermen for their fish. Overall commercial economic benefits are not able to be quantified due to a lack of cost data for specific species. However, under the above assumption that a season extension is beneficial, it appears that **Alternative 6** is preferable to the other alternatives followed by **Alternative 5**, **Alternative 3 (Preferred)**, and **Alternative 4** based on the number of weeks fishermen are expected to be able to fish. The early closures during the early part of the calendar year would result in long-term economic benefits in that the spawning season would be protected. The change in the fishing year under **Alternatives 5** and **6** for the recreational fishery would result in a longer season than if no change were made to the start of the fishing year (**Alternatives 1, 3,** and **4**). This indicates that **Alternatives 5** and **6** would result in short-term economic benefits to the recreational fishery but a decrease in long-term economic benefits due to a decrease in biological benefits under **Alternatives 5** and **6**, as discussed above under the Biological Effects section.

Alternatives 7 (Preferred) and **8** allow for unused portions of the quota to be used during the next portion of the fishing season or the next year. Both would be economically beneficial to fishermen in the short-term. However, if this results in overfishing or interruption of the rebuilding plan, then long-term economic benefits would be negative.

Alternatives 9-11 identify a certain portion of the commercial quota that, once reached, would prohibit pot gear users from fishing. An evaluation of **Alternative 9**, in conjunction with **Alternatives 3 (Preferred)-6**, is shown in **Table 4-7**. The results indicate that **Alternatives 3 (Preferred), 4,** and **6** would have long-term economic benefits in that the fishing would be closed during peak spawning periods. With regards to short-term economic benefits, **Alternative 9** in combination with **Alternative 4** appears to allow for 20 additional fishing days compared to **Alternative 3 (Preferred)**. In general, black sea bass pot users would be disadvantaged by **Alternatives 9-11** since those alternatives decrease fishing opportunities for pot gear users compared to **Alternative 1 (No Action)**. However, these alternatives benefit hook and line users. Although, it is mentioned above that black sea bass appears to be an incidental catch for hook and line users. **Alternative 10** is economically preferable to **Alternative 9** for pot users given that pot users can land more black sea bass under **Alternative 10**. **Alternative 11** is economically preferable for pot users than both **Alternatives 9** and **10** since it allows access to greater amounts of commercial quota.

Sub-Alternatives 12a-12d propose a spawning season closure for commercial and recreational sectors. **Table 4-19** shows the commercial short-term economic effects in the form of foregone dockside revenues of each sub-alternative. **Sub-Alternative 12c** results in the largest loss in dockside revenues while **Sub-Alternative 12d** results in the smallest loss. While the spawning season closures in **Sub-Alternatives 12a and 12b** are of the same approximate length, **Sub-Alternative 12a** has the larger loss associated with it due to the relatively large amount of black sea bass harvested in March compared to May. On average, 2007-09 dockside revenues amounted to about $1.6 million for black sea bass.

Table 4-19. Dockside revenues foregone as a result of Sub-Alternatives 12a-12d based on 2007-2009 average landings data.

Sub-Alternative	Total revenue loss in 2009 dollars (ex-vessel revenue)
12a (March 1 - April 30)	$182,000
12b (April 1 - May 31)	$96,000
12c (March 1 - May 31)	$212,000
12d (May 1 – May 31)	$47,000

Recreational Sector Impacts

<u>Analytical Approach to Data</u>

The economic effects of the spawning closure and bag limit alternatives are examined by evaluating their resulting expected changes in consumer surplus (CS) to anglers and net operating revenue (NOR) to the for-hire sector. A constant CS value of $31 per fish (Haab *et al.* 2008) and constant NOR value of $128 per angler trip for charterboats and $68 per angler trip (day) for headboats (Dumas *et al.*, 2009; NMFS 2009) are used. These are the same values used in analyzing the economic effects of this amendment's spawning closure alternatives on the recreational sector. The NOR values are also the same ones used in the economic analysis for Amendment 17A (SAFMC 2010a) and Amendment 17B (SAFMC 2010b). A different CS value was used in these two amendments, however, because of differences in the main species affected. Harvest and target trip data for the shore, charter, and private modes are based on MRFSS while harvest and trips for headboats are based on the Headboat Survey.

There are at least two important limitations that need to be recognized in the current analysis. First, the effects of the various alternatives are estimated without consideration of the potential change in angler behavior in response to new regulations. This behavioral change can potentially reduce some of the negative effects of the various alternatives. Second, there are uncertainties in the CS and NOR values as well as in some variables (e.g., harvests, target trips) that are not incorporated into the quantitative estimates. When combined, these uncertainties would have relatively unknown consequences on the resulting estimates of economic effects.

Spawning Closure

The short-term effects on net operating revenues of for-hire vessels are shown in **Table 4-20**. Based on total effects, **Sub-Alternative 12c** would result in the largest forgone net operating revenues and **Sub-Alternative 12d**, the lowest. This result is almost as expected since **Sub-Alternative 12c** would impose a three-month closure and **Sub-Alternative 12d**, a one-month closure. **Sub-Alternatives 12a** and **12b** would impose a two-month closure. The same pattern of effects can observed for headboats but not quite for charterboats. For headboats, **Sub-Alternative 12c** would result in the largest forgone net operating profits and **Sub-Alternative 12d**, the lowest. For charterboats, **Sub-Alternative 12c** would result in the largest effects and **Sub-Alternative 12a**, the lowest. Based on 2007-2009 data, charterboat anglers indicated higher target trips for black sea bass in May than in March and April combined.

The estimated effects presented in **Table 4-20** may overestimate actual effects if the for-hire fishing vessels are able to shift their effort (trips) to the open season. It is possible, though, that those re-scheduled trips would not totally recoup losses incurred from being unable to fish for black sea bass during the closed months.

Table 4-20. Forgone net operating revenues (2009 dollars) due to the spawning closure alternatives.

Sub-Alternative	Charterboat	Headboat	Total
12a	$112,640	$134,109	$246,749
12b	$189,138	$151,989	$341,127
12c	$246,381	$210,950	$457,331
12d	$133,741	$76,841	$210,582

Based on 2007-2009 MRFSS data, **Sub-Alternative 12a** would result in a loss of approximately 70,000 black sea bass. Using a CS value of $31 per fish, this calculates to a loss of approximately $2.17 million. A loss of 80,000 black sea bass (2.48 million) is expected under **Sub-Alternative 12b** while 115,000 black sea bass ($3.57 million) and 45,000 sea bass ($1.4 million) would not be caught under **Sub-Alternatives 2c** and **2d**, respectively.

In general, implementation of a spawning season closure will result in long-term economic benefits for the recreational (and commercial) sector with **Sub-Alternative 12c** having the greatest long-term economic benefit and **Sub-Alternative 12d** the smallest. However, as mentioned above in the Biological Effects section, biological benefits will vary by state and the economic benefits could follow that same pattern depending on how much movement of black sea bass there is between states.

<u>Bag Limits</u>

Alternative 13 and its sub-alternatives consider a reduction in the daily recreational bag limit in order to prevent or at least reduce the length of a recreational fishing closure. In the 2010-2011 fishing season, the recreational ACL for black sea bass was reached, triggering the application of the sector's AM, and prohibition of recreational black sea bass harvest for slightly more than 3 months. For the following analysis, it is assumed that the same length of closure would occur annually given the current ACL, bag and size limits, and fishing pressure (effort).

In this case, the success of a bag limit reduction is generally judged by the extent it would be expected to lengthen the recreational fishing season. The accompanying economic issue is closely related to but not totally conditioned on the number of days the fishing season is lengthened. A closed fishing season would be expected to result in fewer fishing trips and a loss in economic benefits associated with these trips. Conversely, longer open season would be expected to result in more trips and increased economic benefits. However, a bag limit reduction, implemented to extend the season, would be expected to result in lower economic benefits per day or per trip because of the potential reduced quality of the fishing trip. Depending on the bag limit, the resulting reduction in benefits associated with the lower quality trips could be less than, equal to, or more than the increase in benefits associated with the increased number of trips (or the trips that were cancelled as a result of the original closure). As a result, the primary economic issue is whether the increase in benefits associated with more trips is greater than, or at least equal to, the reduction in benefits associated with lower quality trips (for all trips, including those that are "recovered" as a result of the shortened closure).

Undoubtedly, the bag limit level, or the amount of bag limit reduction, is crucial in the success of the measure. In terms of lengthening the season, the ideal bag limit is perhaps one that would allow the fishery to remain open year round without leaving a good portion of the ACL unharvested. Given the primary economic issue noted above, a bag limit level does not have to be ideal so long as it results in better economic condition. This means that the bag limit that would result in the greatest economic benefits could leave a portion of the ACL unharvested or still bring about an ACL-based closure, albeit a shorter one.

If all of the alternatives result in the same fishing season length, there is good reason to believe the highest bag limit would be economically best. Very likely, however, the different alternatives would result in different fishing season lengths. It is likely that the lowest bag limit would result in the longest fishing season, but it would not necessarily result in the most economic benefits because the lowest bag limit would be expected to be accompanied by the largest reduction in fishing quality-based economic benefits per trip. The sum of these quality-based reductions in economic benefits could potentially be larger than the benefits from an alternative with a higher bag limit and shorter season.

As currently developed, the bag limit sub-alternatives under **Alternative 13** are not directly comparable because different base years were used to calculate them. Each alternative bag limit has been calculated in such a way that the fishery would remain open throughout the fishing year without exceeding the ACL. In this sense, each alternative would be best if future fishing performance mimics, or closely mimics, the fishing conditions in the relevant year on which the alternative was based. This nature of the alternatives virtually renders a direct determination of which alternative is economically best infeasible. As a result, the following analysis uses an indirect approach.

In analyzing the alternatives, there are at least three major factors to consider: (1) the bag limit could still lead to an ACL-based closure; (2) different bag limits would be associated with different CS values because of different levels of fishing quality; and, (3) there are possibly some bag limit levels that would result in trip cancellation.

One major characteristic of the alternatives is that each specifies a bag limit designed to allow year-round recreational harvest of black sea bass, assuming that future conditions match the conditions in the relevant base year. Where a mismatch occurs, the ACL may or may not be exceeded. **Table 4-13** (Biological Effects) shows when the ACL would be expected to be met (or not) under various combinations of bag limits and baseline fishing year. Even at the current bag limit of 15 fish per person per day, the ACL would be met at different times of the year for different base years. Given the results of **Table 4-13**, there are several alternatives worth investigating and they are listed in **Table 4-21**. Although there are only five alternative bag limits, evaluation of the several variations of the five bag limit alternatives should provide some insights into the cost of the chosen alternative if the actual harvests turn out to be different from those assumed in the alternative.

Because of the three baseline years used in developing the bag limit alternatives, it is deemed necessary to consider three potential reference points, or "no action" alternatives. Recall that the three baseline years were used because of the need to develop bag limit alternatives that would keep recreational fishing for black sea bass open year-round. In **Table 4-21**, **Alternative A.13.0.1** is the baseline alternative when using harvest from the 2008-2009 fishing year; **Alternative A.13.0.2** is the baseline alternative when using harvest from the 2009-2010 fishing year; and **Alternative A.13.0.3** is the baseline alternative when using harvest from the 2010-2011 fishing year. As shown in the table, **Alternative A.13.0.1** maintains a 15-fish bag limit, with a recreational fishing closure for black sea bass from May 5th through May 31st. **Alternative A.13.0.2** has a 15-fish bag limit with closure from April 9th through May 31st. **Alternative A13.0.3** has a 15-fish bag limit with closure from January 2nd through May 31st. Each of the lower bag limit alternatives has three variants corresponding to the three baseline alternatives, as indicated by the last digit in each alternative. Take the case, for example, of a 7-fish bag limit: **Alternative A.13.1.1** is a 7-fish bag limit relative to the 15-fish bag limit of **Alternative A.13.0.1**; **Alternative A.13.1.2** is a 7-fish bag limit relative to the 15-fish bag limit of **Alternative A.13.0.2**; and, **Alternative A.13.1.3** is a 7-fish bag limit relative to the 15-fish bag limit of **Alternative A.13.0.3.**

Table 4-21. Combinations of bag limits and ACL-based closure.

Alternatives	Description
A.13.0.1	15 fish bag limit; ACL-based closure May 5-31
A.13.0.2	15 fish bag limit; ACL-based closure April 9-May 31
A.13.0.3	15 fish bag limit; ACL-based closure January 2-May 31
A.13.1.1	7 fish bag limit; ACL-based closure May 28-31
A.13.1.2	7 fish bag limit; ACL-based closure April 19-May 31
A.13.1.3	7 fish bag limit; ACL-based closure February 5-May 31
A.13.2.1	5 fish bag limit; no ACL-based closure
A.13.2.2	5 fish bag limit; ACL-based closure April 29-May 31
A.13.2.3	5 fish bag limit; ACL-based closure March 7-May 31
A.13.3.1	3 fish bag limit; no ACL-based closure
A.13.3.2	3 fish bag limit; ACL-based closure May 26-31
A.13.3.3	3 fish bag limit; ACL-based closure April 25-May 31
A.13.4.1*	2 fish bag limit; no ACL-based closure
A.13.5.1*	1 fish bag limit; no ACL-based closure

*These alternatives have no variants because they do not result in ACL-based closure.

A bag limit change would be expected to alter the nature of the fishing experience for some or all anglers fishing through different fishing platforms (shore, private, charter, headboat), resulting in CS changes. It is also possible that the CS change may differ between anglers harvesting different numbers of fish or anglers harvesting the same number of fish but through different fishing modes. In addition, the CS change from going from a 15-fish bag limit to a 7-fish bag limit (**Sub-Alternative 13a**) would also be expected to differ from that associated with a reduction from 15-fish and 3-fish bag limit (**Sub-Alternative 13c**). These possibilities are recognized but not directly addressed in this analysis. For the current analysis, the change in CS value due to a bag limit change is evaluated mainly by determining the number of fish that would be forgone under the various bag limits and multiplying this number by the CS per fish. The reduction in the number of fish due to a bag limit is based on harvest reductions shown in **Table 4-12a** (Biological Effects). The CS value is assumed constant regardless of the amount of bag limit reduction, so the only source of CS changes in this case would be the change in the number of fish harvested. This assumption partly rules out uncertainties surrounding the fixed CS employed in the current analysis.

It is possible that some anglers may deem a bag limit too low to be worth taking the fishing trip. What this bag limit threshold is, which could differ by anglers and by fishing mode (even fishing day or month for the same angler), cannot be determined with available data. To partially address this issue of potential trip cancellation and its effects on NOR only, this analysis takes a sensitivity analysis approach, examining the expected reduction in NOR under different levels of trip cancellation (**Table 4-25**). These reductions are only applied to trips that would be affected by the bag limit. The number of potentially affected trips is calculated by determining the percentage of trips that harvested more than a particular bag limit, using the 2007-2009 MRFSS/MRIP data.

The data used in the current analysis includes the average number of fishing trips and number of fish harvested by mode and month for the fishing years 2007-2008 through 2009-2010. For headboats, trip reports for 2007-2010 are used to calculate the ratio of trips harvesting black sea bass relative to all trips harvesting any snapper grouper species. This ratio is applied to the estimated number of angler days to calculate the number of black sea bass trips. Because an estimate of the number of headboat angler days in 2010 is not yet available, it is assumed that the number of angler days for January-May 2010 was similar to those for January-May 2009. For charterboat, private, and shore modes, the fishing trips used is black sea bass target trips (an extrapolated estimate based on the number of intercepts on which black sea bass were identified as the first or second primary species targeted). Again, it is assumed that the number of target trips for January-May 2010 was the same as those for the same period in 2009. The number of fish harvested by anglers through the shore, private, and charter modes are those reported for 2007-2010 (NMFS 2010), with the 2010 data being preliminary. For the number of fish harvested by headboat anglers, it is again assumed that harvests in January-May 2010 were the same as those for the same months in 2009. The CS and NOR values have already been discussed above.

The economic effects of the various alternatives are summarized in **Table 4-22**. All the numbers represent expected changes relative to the average fishing performance in the fishing years 2007-2008 to 2009-2010. These changes are solely due to the ACL-based closures that would result under the various bag limit alternatives.

Table 4-22. Economic effects of the bag limit alternatives, with consideration of ACL-based closure only.
CS and NOR are in 2009 dollars.

Alternatives	Fishing Mode	Reductions in Trips	Reductions in Harvest (No. of Fish)	Reduction in Consumer Surplus (CS)	Reduction in Net Operating Revenue (NOR)
A.13.0.1	Shore	0	708	$21,937	
	Private	1,643	25,736	$797,803	
	Charter	741	13,098	$406,039	$94,906
	Headboat	1,013	12,773	$395,965	$68,907
A.13.0.2	Shore	332	1,496	$46,367	
	Private	4,612	51,635	$1,600,682	
	Charter	1,144	18,799	$582,758	$146,433
	Headboat	2,024	23,328	$723,169	$137,665
A.13.0.3	Shore	924	2,683	$83,165	
	Private	12,772	132,669	$4,112,725	
	Charter	1,681	26,311	$815,647	$215,114
	Headboat	4,024	42,624	$1,321,354	$273,643
A.13.1.1	Shore	0	106	$3,278	
	Private	245	3,846	$119,212	
	Charter	111	1,957	$60,673	$14,181
	Headboat	151	1,909	$59,167	$10,296
A.13.1.2	Shore	182	1,187	$36,805	
	Private	3,381	41,665	$1,291,627	
	Charter	1,012	17,106	$530,299	$129,551
	Headboat	1,636	19,419	$602,001	$111,237

Table 4-22. Continued. Economic effects of the bag limit alternatives, with consideration of ACL-based closure only.
CS and NOR are in 2009 dollars.

Alternatives	Fishing Mode	Reductions in Trips	Reductions in Harvest (No. of Fish)	Reduction in Consumer Surplus (CS)	Reduction in Net Operating Revenue (NOR)
A.13.1.3	Shore	924	2,683	$83,165	
	Private	10,759	107,496	$3,332,361	
	Charter	1,671	25,721	$797,357	$213,889
	Headboat	3,612	38,109	$1,181,394	$245,592
A.13.2.1	Shore	0	0	$0	
	Private	0	0	$0	
	Charter	0	0	$0	$0
	Headboat	0	0	$0	$0
A.13.2.2	Shore	14	841	$26,084	
	Private	2,000	30,487	$945,111	
	Charter	864	15,209	$471,481	$110,622
	Headboat	1,200	15,037	$466,147	$81,606
A.13.2.3	Shore	835	2,505	$77,660	
	Private	8,744	84,262	$2,612,134	
	Charter	1,586	24,337	$754,444	$203,065
	Headboat	3,051	32,933	$1,020,909	$207,476
A.13.3.1	Shore	0	0	$0	
	Private	0	0	$0	
	Charter	0	0	$0	$0
	Headboat	0	0	$0	$0
A.13.3.2	Shore	0	155	$4,791	
	Private	359	5,620	$174,233	
	Charter	162	2,860	$88,675	$20,727
	Headboat	221	2,790	$86,475	$15,049
A.13.3.3	Shore	91	1,000	$31,010	
	Private	2,634	35,623	$1,104,321	
	Charter	932	16,081	$498,505	$119,319
	Headboat	1,400	17,051	$528,567	$95,220
A.13.4.1	Shore	0	0	$0	
	Private	0	0	$0	
	Charter	0	0	$0	$0
	Headboat	0	0	$0	$0
A.13.5.1	Shore	0	0	$0	
	Private	0	0	$0	
	Charter	0	0	$0	$0
	Headboat	0	0	$0	$0

Based on information from **Table 4-12a** (Biological Effects), a 15-fish bag limit would not be expected to reduce harvests of black sea bass. A 7-fish bag limit (**Sub-Alternative 13a**) would be expected to reduce headboat harvest by 8%, charter harvest by 13% and private mode harvest by 5%. A 5-fish bag limit (**Sub-Alternative 13b (Preferred)**) would be expected to reduce headboat harvest by 14%, charter harvest by 20%, and private mode harvest by 5%. A 3-fish bag limit (**Sub-Alternative 13c**) would be expected to reduce headboat harvest by 25%, charter harvest by 35%, and private mode harvest by 23%. A 2-fish bag limit (**Sub-Alternative 13d**) would be expected to reduce headboat harvest by 34%, charter harvest by 49%, and private mode harvest by 35%. A 1-fish bag limit (**Sub-Alternative 13e**) would be expected to reduce headboat harvest by 51%, charter harvest by 69%, and private mode harvest by 56%. It is assumed that reductions for the shore mode would follow the average reduction for all sectors: 6% under a 7-fish bag limit (**Sub-Alternative 13a**), 12% under a 5-fish bag limit (**Sub-Alternative 13b (Preferred)**), 25% under a 3-fish bag limit (**Sub-Alternative 13c**), 37% under a 2-fish bag limit (**Sub-Alternative 13d**), and 57% under a 1-fish bag limit (**Sub-Alternative 13e**).

Table 4-23 presents the estimated reductions in CS associated with lower quality fishing trips resulting from the various bag limit alternatives. These reductions would be in addition to the CS reductions due to the ACL-based closures, i.e., reduced CS associated with cancelled trips. An important underlying assumption in these results is that no trips for black sea bass fishing would be cancelled during the open season as a result of the reduction in the bag limit and quality of the trip.

Table 4-23. Additional reductions in CS (2009 dollars) of the bag limit alternatives as a result of CS reductions per trip.

Alternatives	Fishing Mode	Reduction Consumer Surplus (CS)
A.13.0.1	Shore	$0
	Private	$0
	Charter	$0
	Headboat	$0
A.13.0.2	Shore	$0
	Private	$0
	Charter	$0
	Headboat	$0
A.13.0.3	Shore	$0
	Private	$0
	Charter	$0
	Headboat	$0
A.13.1.1	Shore	$8,848
	Private	$523,813
	Charter	$266,434
	Headboat	$306,513
A.13.1.2	Shore	$8,848
	Private	$523,813
	Charter	$266,434
	Headboat	$306,513
A.13.1.3	Shore	$8,848
	Private	$523,813
	Charter	$266,434
	Headboat	$306,513

Table 4-23. Continued. Additional reductions in CS (2009 dollars) of the bag limit alternatives as a result of CS reductions per trip.

Alternatives	Fishing Mode	Reduction Consumer Surplus (CS)
A.13.2.1	Shore	$17,695
	Private	$523,813
	Charter	$409,899
	Headboat	$536,398
A.13.2.2	Shore	$17,695
	Private	$523,813
	Charter	$409,899
	Headboat	$536,398
A.13.2.3	Shore	$17,695
	Private	$523,813
	Charter	$409,899
	Headboat	$536,398
A.13.3.1	Shore	$36,865
	Private	$2,409,542
	Charter	$717,323
	Headboat	$957,854
A.13.3.2	Shore	$36,865
	Private	$2,409,542
	Charter	$717,323
	Headboat	$957,854
A.13.3.3	Shore	$36,865
	Private	$2,409,542
	Charter	$717,323
	Headboat	$957,854
A.13.4.1	Shore	$54,560
	Private	$3,666,694
	Charter	$1,004,253
	Headboat	$1,302,681
A.13.5.1	Shore	$84,052
	Private	$5,866,710
	Charter	$1,414,152
	Headboat	$1,954,021

To aid in evaluating the expected changes in NOR due to trip cancellations, the percentage of trips targeting black sea bass and catching a certain number of fish is calculated and presented in **Table 4-24**. For the succeeding discussion, it is assumed that the percentages for all trips targeting black sea bass across the private and charter modes equally apply to the shore and headboat modes. Based on this table, it appears that a 15-fish bag limit would not affect any target trips. A 7-fish bag limit (**Sub-Alternative 13a**) would be expected to affect 11% of private trips, 14% of charter trips, and 12% of shore and headboat trips. A 5-fish bag limit **(Sub-Alternative 13b (Preferred))** would be expected to affect 25% of private trips, 20% of charter trips, and 23% of shore and headboat trips. A 3-fish bag limit **(Sub-Alternative 13c)** would be expected to affect 53% of private trips, 62% of charter target trips, and 57% of shore and headboat trips. A 2-fish bag limit **(Sub-Alternative 13d)** would be expected to affect 72% of private trips, 79% of charter target trips, and 75% of shore and headboat trips. A 1-fish bag limit

(Sub-Alternative 13e) would be expected to affect 86% of private trips, 97% of charter target trips, and 91% of shore and headboat trips.

Table 4-24. Percent of trips targeting and catching black seas bass, by mode, 2007-2009.

No. of Fish	Private Trips Targeting Black Sea Bass		Charter Trips Targeting Black Sea Bass		All Trips Targeting Black Sea Bass	
	Percent	Cumm. Percent	Percent	Cumm. Percent	Percent	Cumm. Percent
1	13.89%	13.89%	3.45%	3.45%	9.23%	9.23%
2	13.89%	27.78%	17.24%	20.69%	15.38%	24.62%
3	19.44%	47.22%	17.24%	37.93%	18.46%	43.08%
4	11.11%	58.33%	17.24%	55.17%	13.85%	56.92%
5	16.67%	75.00%	24.14%	79.31%	20.00%	76.92%
6	8.33%	83.33%	6.90%	86.21%	7.69%	84.62%
7	5.56%	88.89%	0.00%	86.21%	3.08%	87.69%
8	5.56%	94.44%	0.00%	86.21%	3.08%	90.77%
9	0.00%	94.44%	0.00%	86.21%	0.00%	90.77%
10	2.78%	97.22%	0.00%	86.21%	1.54%	92.31%
11	0.00%	97.22%	0.00%	86.21%	0.00%	92.31%
12	2.78%	100.00%	10.34%	96.55%	6.15%	98.46%
13	0.00%	100.00%	3.45%	100.00%	1.54%	100.00%
14	0.00%	100.00%	0.00%	100.00%	0.00%	100.00%
15	0.00%	100.00%	0.00%	100.00%	0.00%	100.00%

Table 4-25 presents the estimated changes in NOR due to trip cancellations during the open season. Although these expected changes would be in addition to the expected changes in NOR associated with the ACL-based closures presented earlier, the two types of effects should not be summed. NOR changes due to ACL-based closures have to be adjusted for the trips that would not take place anyway after the ACL is reached.

Table 4-25. Reductions in NOR (2009 dollars) due to trip cancellations during the open season under various assumptions on the percent of affected trips cancelled.

Alternatives	Fishing Mode	Assumed Percent Cancellation of Affected Trips			
		50%	25%	10%	5%
A.13.0.1	Shore				
	Private				
	Charter	$0	$0	$0	$0
	Headboat	$0	$0	$0	$0
A.13.0.2	Shore				
	Private				
	Charter	$0	$0	$0	$0
	Headboat	$0	$0	$0	$0
A.13.0.3	Shore				
	Private				
	Charter	$0	$0	$0	$0
	Headboat	$0	$0	$0	$0

Table 4-25. Continued. Reductions in NOR (2009 dollars) due to trip cancellations during the open season under various assumptions on the percent of affected trips cancelled.

Alternatives	Fishing Mode	Assumed Percent Cancellation of Affected Trips			
		50%	25%	10%	5%
A.13.1.1	Shore				
	Private				
	Charter	$44,023	$22,012	$8,805	$4,402
	Headboat	$54,015	$27,008	$10,803	$5,402
A.13.1.2	Shore				
	Private				
	Charter	$44,023	$22,012	$8,805	$4,402
	Headboat	$54,015	$27,008	$10,803	$5,402
A.13.1.3	Shore				
	Private				
	Charter	$44,023	$22,012	$8,805	$4,402
	Headboat	$54,015	$27,008	$10,803	$5,402
A.13.2.1	Shore				
	Private				
	Charter	$62,891	$31,445	$12,578	$6,289
	Headboat	$103,529	$51,765	$20,706	$10,353
A.13.2.2	Shore				
	Private				
	Charter	$62,891	$31,445	$12,578	$6,289
	Headboat	$103,529	$51,765	$20,706	$10,353
A.13.2.3	Shore				
	Private				
	Charter	$62,891	$31,445	$12,578	$6,289
	Headboat	$103,529	$51,765	$20,706	$10,353
A.13.3.1	Shore				
	Private				
	Charter	$194,961	$97,481	$38,992	$19,496
	Headboat	$256,572	$128,286	$51,314	$25,657
A.13.3.2	Shore				
	Private				
	Charter	$194,961	$97,481	$38,992	$19,496
	Headboat	$256,572	$128,286	$51,314	$25,657
A.13.3.3	Shore				
	Private				
	Charter	$194,961	$97,481	$38,992	$19,496
	Headboat	$256,572	$128,286	$51,314	$25,657
A.13.4.1	Shore				
	Private				
	Charter	$248,418	$124,209	$49,684	$24,842
	Headboat	$337,595	$168,797	$67,519	$33,759
A.13.5.1	Shore				
	Private				
	Charter	$305,020	$152,510	$61,004	$30,502
	Headboat	$409,615	$204,807	$81,923	$40,961

The information presented above can be combined in a number of ways, but only few combinations are presented below for purposes of understanding the economic implications of the three bag limit alternatives. **Table 4-26a** presents a summary of the expected economic effects of the sub-alternatives under **Alternative 13**. This table only presents the economic effects of ACL-based closure and reduction in CS due to a lower bag limit. The total CS equals the sum of CS reductions due to the ACL-based closure and CS reductions due to the reduction in bag limits. The estimated reduction in NOR is associated with trip cancellation due to the ACL-based closure and does not include the effects of any trip cancellation during the open season in response to a prohibitively restrictive bag limit. All the numbers are reductions in CS and NOR relative to the 2007/08-2009/10 period. Therefore, alternatives with lower values are better than those alternatives with higher values. If one assumes the 15-fish bag limit as the baseline, then the values from the other alternatives should be subtracted from the values in the baseline. If done this way, some alternatives will have positive values and others negative.

Future black sea bass fishing performance of the recreational sector plays a vital role in the ranking of alternatives. If this performance is similar to that in the 2008-2009 fishing season, the alternatives, excluding the 15-fish bag limit, may be ranked in descending order as follows: **Sub-Alternatives 13a, 13b (Preferred), 13c, 13d** and **13e.** If such future performance is similar to that in the 2009-2010 fishing season, the ranking is the same. If future performance is similar to that in the 2010-2011 fishing season, the ranking is as follows: **Sub-Alternative 13d, 13b (Preferred), 13c, 13a** and **13e**.

There are several notable points worth considering in the ranking of alternatives. First, a 5-fish bag limit **(Sub-Alternative 13b (Preferred))** consistently ranks second across the three baseline years. Second, the 7-fish bag limit **(Sub-Alternative 13a)** is ranked first in two of the three baseline years. Third, the high rank of the 2-fish bag limit (**Sub-Alternative 13d**) in one of the three base years is rather unexpected. It may be noted in this case that the only source of reduction due to this bag limit is the reduction in CS as a result of a lower bag limit and lower quality trips. In addition, the ranking shown in **Table 4-26a** does not take into account the possible reduction in NOR due to trip cancellation. The issue of trip cancellation is partially addressed below. Fifth, the 15-fish bag limit would result in lower CS and NOR reductions than some other alternatives in some baseline years, notably the 2009-2010 and 2010-2011 fishing seasons. One reason for this is that some alternatives would be associated with relatively large reductions in economic benefits due to reductions in the quality of fishing experience. In these alternatives, the gain from a shorter ACL-based closure is not large enough to outweigh the loss from a reduction in the quality of fishing.

Table 4-26a. Aggregate reductions in CS and NOR (2009 dollars) assuming no trip cancellation during the open season.

Alternative	ACL-based Closure		Reduction Per Trip	Total NOR	Total CS	TOTAL
	CS	NOR	CS			
15-Fish Bag Limit						
A.13.0.1	$1,621,744	$163,813	$0	$163,813	$1,621,744	$1,785,557
A.13.0.2	$2,952,976	$284,098	$0	$284,098	$2,952,976	$3,237,074
A.13.0.3	$6,332,891	$488,757	$0	$488,757	$6,332,891	$6,821,648
7-Fish Bag Limit						
A.13.1.1	$242,330	$24,478	$1,105,609	$24,478	$1,347,938	$1,372,416
A.13.1.2	$2,460,733	$240,788	$1,105,609	$240,788	$3,566,341	$3,807,129
A.13.1.3	$5,394,278	$459,481	$1,105,609	$459,481	$6,499,886	$6,959,367
5-Fish Bag Limit (Preferred)						
A.13.2.1	$0	$0	$1,487,806	$0	$1,487,806	$1,487,806
A.13.2.2	$1,908,823	$192,228	$1,487,806	$192,228	$3,396,629	$3,588,857
A.13.2.3	$4,465,147	$410,541	$1,487,806	$410,541	$5,952,953	$6,363,494
3-Fish Bag Limit						
A.13.3.1	$0	$0	$4,121,584	$0	$4,121,584	$4,121,584
A.13.3.2	$354,174	$35,775	$4,121,584	$35,775	$4,475,758	$4,511,533
A.13.3.3	$2,162,403	$214,539	$4,121,584	$214,539	$6,283,987	$6,498,526
2-Fish Bag Limit						
A.13.4.1	$0	$0	$6,028,187	$0	$6,028,187	$6,028,187
1-Fish Bag Limit						
A.13.5.1	$0	$0	$9,318,935	$0	$9,318,935	$9,318,935

The results may also be presented by considering the 15-fish bag limit as the point of reference (see **Table 4-26b**). In this case each of the 15-fish bag limits with different baseline fishing years may be considered the "no action" alternative. Positive (negative/red) values indicate that the subject bag limit would be economically better (worse) than the 15-fish bag limit, given the relevant base fishing year. For example, the 5-fish bag limit would be economically better than the 15-fish bag limit in two out three baseline years. That is, if future harvests approximate the 2008-2009 or 2010- 2011 harvests, the 5-fish bag limit may be considered economically better than the 15-fish bag limit. As shown in the table, the negative effects would arise solely from the reduction in CS due to the reduction in the bag limit. In these cases, gains from having a shorter ACL-based closure would not outweigh the losses due to the reduction in the bag limit.

Table 4-26b. Changes in CS and NOR (2009 dollars) relative to the baseline 15-fish bag limit, assuming no trip cancellation during the open season.

Alternative	ACL-based Closure		Reduction Per Trip	Total NOR	Total CS	TOTAL
	CS	NOR	CS			
15-Fish Bag Limit						
A.13.0.1	$0	$0	$0	$0	$0	$0
A.13.0.2	$0	$0	$0	$0	$0	$0
A.13.0.3	$0	$0	$0	$0	$0	$0
7-Fish Bag Limit						
A.13.1.1	$1,379,415	$139,335	-$1,105,609	$139,335	$273,806	$826,283
A.13.1.2	$492,244	$43,310	-$1,105,609	$43,310	-$613,365	-$1,140,110
A.13.1.3	$938,613	$29,276	-$1,105,609	$29,276	-$166,995	-$275,438
5-Fish Bag Limit (Preferred)						
A.13.2.1	$1,621,744	$163,813	-$1,487,806	$163,813	$133,939	$595,503
A.13.2.2	$1,044,153	$91,870	-$1,487,806	$91,870	-$443,653	-$703,566
A.13.2.3	$1,867,744	$78,216	-$1,487,806	$78,216	$379,938	$916,308
3-Fish Bag Limit						
A.13.3.1	$1,621,744	$163,813	-$4,121,584	$163,813	-$2,499,839	-$4,672,052
A.13.3.2	$2,598,802	$248,322	-$4,121,584	$248,322	-$1,522,781	-$2,548,918
A.13.3.3	$4,170,488	$274,218	-$4,121,584	$274,218	$48,904	$646,244
2-Fish Bag Limit						
A.13.4.1	$6,332,891	$488,757	-$6,028,187	$488,757	$304,704	$1,586,921
1-Fish Bag Limit						
A.13.5.1	$6,332,891	$488,757	-$9,318,935	$488,757	-$2,986,044	-$4,994,574

As noted earlier, the reductions in NOR due to the ACL-based closure are not additive to the reductions in NOR due to the bag limit reduction, unless forgone trips during the ACL-based closure are adjusted for trips cancelled during the open season. However, in cases where there are no ACL-based closures, such as in the 2-fish **(Sub-Alternative 13d)** and 1-fish bag limit **(Sub-Alternative 13e)**, the two types of NOR reductions are directly additive. To partially take this into account, reductions in NOR due to trip cancellation during the open season are added to the ACL-based reductions in NOR by assuming the following percent trip reduction: 5% under the 7-fish bag limit **(Sub-Alternative 13a)**, 10% under the 5-fish bag limit **(Sub-Alternative 13b Preferred)**, 25% under the 3-fish bag limit **(Sub-Alternative 13c)**, and 50% under the 2-fish **(Sub-Alternative 13d)** and 1-fish bag limit **(Sub-Alternative 13e)**. Although there is no economic basis for these assumed percent reductions, there is some expectation that lower bag limits would be associated with higher probability of trip cancellation. Results are presented in **Table 4-27a**.

There are some changes in the ranking of alternative when trip cancellations occur during the open season. If future black sea bass fishing performance of the recreational sector is similar to that in the 2008-2009 fishing season, the alternatives, excluding the 15-fish bag limit, may be ranked in descending order as follows: **Sub-Alternative 13a, 13b (Preferred), 13c, 13d,** and **13e**. If such future performance is similar to that in the 2009-2010 fishing season, the ranking is as follows: **Sub-Alternative 13b (Preferred), 13a, 13c, 13d** and **13e**. If future performance is similar to that in the 2010-2011 fishing season, the ranking is as follows: **Sub-Alternative 13b (Preferred), 13d, 13c, 13a** and **13e.**

Table 4-27a. Aggregate reductions in CS and NOR (2009 dollars) assuming trip cancellation during the open season of 5% with 7-fish, 10% with 5-fish, 25% with 3-fish, 50% with 2-fish, and 50% with 1-fish bag limit.

Alt.	ACL-Based Closure		Trip-Based Reduction		Total NOR	Total CS	TOTAL
	CS	NOR	CS	NOR			
15-Fish Bag Limit							
A.13.0.1	$1,621,744	$163,813	$0	$0	$163,813	$1,621,744	$1,785,557
A.13.0.2	$2,952,976	$284,098	$0	$0	$284,098	$2,952,976	$3,237,074
A.13.0.3	$6,332,891	$488,757	$0	$0	$488,757	$6,332,891	$6,821,648
7-Fish Bag Limit							
A.13.1.1	$242,330	$24,478	$1,105,609	$9,804	$34,282	$1,347,938	$1,382,220
A.13.1.2	$2,460,733	$240,788	$1,105,609	$9,804	$250,592	$3,566,341	$3,816,933
A.13.1.3	$5,394,278	$459,481	$1,105,609	$9,804	$469,285	$6,499,886	$6,969,171
5-Fish Bag Limit (Preferred)							
A.13.2.1	$0	$0	$1,487,806	$33,284	$33,284	$1,487,806	$1,521,090
A.13.2.2	$1,908,823	$192,228	$1,487,806	$33,284	$225,512	$3,396,629	$3,622,141
A.13.2.3	$4,465,147	$410,541	$1,487,806	$33,284	$443,825	$5,952,953	$6,396,778
3-Fish Bag Limit							
A.13.3.1	$0	$0	$4,121,584	$225,767	$225,767	$4,121,584	$4,347,350
A.13.3.2	$354,174	$35,775	$4,121,584	$225,767	$261,542	$4,475,758	$4,737,299
A.13.3.3	$2,162,403	$214,539	$4,121,584	$225,767	$440,306	$6,283,987	$6,724,293
2-Fish Bag Limit							
A.13.4.1	$0	$0	$6,028,187	$586,013	$586,013	$6,028,187	$6,614,200
1-Fish Bag Limit							
A.13.5.1	$0	$0	$9,318,935	$714,635	$714,635	$9,318,935	$10,033,570

Similar to a previous discussion, the economic effects of the bag limit alternatives may also be measured relative to the 15-fish bag limit (**Table 4-27b**). Positive (negative/red) values indicate that the subject bag limit would be economically better (worse) than the 15-fish bag limit, given the relevant base fishing year. For example, a 5-fish bag limit would be economically better than the 15-fish bag limit in two out three baseline years. That is, if future harvests approximate the 2008-2009 or 2010- 2011 harvests, the 5-fish bag limit may be considered economically better than the 15-fish bag limit. This is exactly the same information presented in **Table 4-27a** but this time in terms of differences from the 15-fish bag limit. The negative effects would arise from the reduction in CS and NOR due to the reduction in the bag limit, with the NOR reduction stemming from the assumed trip cancellations. Only in alternatives with relatively low bag limits (**Sub-Alternatives 13c, 13d,** and **13e**) would reductions in NOR due to the bag limit change outweigh NOR gains due to shorter ACL-based closure. It may be recalled that this is partly due to the assumed percent of affected trips cancelled due to the lower bag limits--higher percent of trip cancellations are assumed with lower bag limits.

Table 4-27b. Changes in CS and NOR (2009 dollars) relative to the baseline 15-fish bag limit, assuming trip cancellation during the open season of 5% with 7-fish, 10% with 5-fish, 25% with 3-fish, 50% with 2-fish, and 50% with 1-fish bag limit.

Alt.	ACL-Based Closure		Trip-Based Reduction		Total NOR	Total CS	TOTAL
	CS	NOR	CS	NOR			
15-Fish Bag Limit							
A.13.0.1	$0	$0	$0	$0	$0	$0	$0
A.13.0.2	$0	$0	$0	$0	$0	$0	$0
A.13.0.3	$0	$0	$0	$0	$0	$0	$0
7-Fish Bag Limit							
A.13.1.1	$1,379,415	$139,335	-$1,105,609	-$9,804	$129,531	$273,806	$806,675
A.13.1.2	$492,244	$43,310	-$1,105,609	-$9,804	$33,506	-$613,365	-$1,159,718
A.13.1.3	$938,613	$29,276	-$1,105,609	-$9,804	$19,472	-$166,995	-$295,046
5-Fish Bag Limit (Preferred)							
A.13.2.1	$1,621,744	$163,813	-$1,487,806	-$33,284	$130,529	$133,939	$528,935
A.13.2.2	$1,044,153	$91,870	-$1,487,806	-$33,284	$58,586	-$443,653	-$770,134
A.13.2.3	$1,867,744	$78,216	-$1,487,806	-$33,284	$44,932	$379,938	$849,740
3-Fish Bag Limit							
A.13.3.1	$1,621,744	$163,813	-$4,121,584	-$225,767	-$61,954	-$2,499,839	-$5,123,586
A.13.3.2	$2,598,802	$248,322	-$4,121,584	-$225,767	$22,556	-$1,522,781	-$3,000,451
A.13.3.3	$4,170,488	$274,218	-$4,121,584	-$225,767	$48,451	$48,904	$194,711
2-Fish Bag Limit							
A.13.4.1	$6,332,891	$488,757	-$6,028,187	-$586,013	-$97,256	$304,704	$414,896
1-Fish Bag Limit							
A.13.5.1	$6,332,891	$488,757	-$9,318,935	-$714,635	-$225,878	-$2,986,044	-$6,423,843

The foregoing estimates of economic effects may likely be overestimates of actual effects. The SSC noted this in their report to the Council based on the potential behavioral response to restrictive regulations. That is, anglers may shift their effort to other species or other fishing areas when they become subject to the restrictive measures on black sea bass. In doing so, they can recoup part or all of their losses from the black sea bass restrictions. However, available information is not sufficient to incorporate angler behavioral responses into the present estimation procedure. At any rate, the foregoing information is deemed sufficient to generate relative ranking of alternatives.

4.1.3 Social Effects

Regulatory change in general may cause some of the following direct and indirect consequences: increased crew and dockside worker turnover; displacement of social or ethnic groups; increased time at sea (potentially leading to increased risk to the safety of life and boat); decreased access to recreational activities; demographic population shifts (such as the entrance of migrant populations replacing or filling a market niche); displacement and relocation as a result of loss of income and the ability to afford to live in coastal communities; increased efforts from outside the fishery to affect fishing related activities; changes in household income source; business failure; declining health and social welfare; and increased gentrification of coastal communities as fishery participants are unable to generate sufficient revenue to remain in the community.

Ultimately, one of the most important measurements of social change is how these social forces, in coordination with the strategies developed and employed by local fishermen to adapt to the regulatory changes, combine to affect the local fishery, fishing activities and methods, and the community as a whole.

Additional indirect effect of fisheries management on the fishing community and related sectors includes increased confusion and differences between the community and the management sector in levels of understanding and agreement on what is best for both the resource and the community. The fact that "the science" can cause relatively large reductions in harvests is particularly disconcerting to many fishermen and concerned stakeholders. This can induce enforcement problems associated with compliance with current and future regulations, which can lead to inefficient use of resources, ineffectual regulations, and failure to meet management targets, which may precipitate additional restrictions.

A motivation for this action is to address the derby that appears to have developed in the commercial black sea bass and the closures that may occur in the recreational sector as a result of ACL/AM management. Derby conditions (market gluts and accelerated quota closures) and ACL closures are generally expected to result in reduced social and economic benefits compared to fisheries that remain open year-round or are managed with fixed closures because of the increased ability to plan fishing and other activities around a fixed schedule. While harvests would still have to be monitored, such that fixed open and closed periods could not be guaranteed, allocating an annual quota or ACL to split seasons increases the flexibility to ensure that the fishery is open, or has a higher probability of being open, in specific months, and reduces the likelihood of longer closures. This allows harvests to be better timed with seasonal demand and/or reduced overlap with closures for other species, potentially resulting in increased social and economic benefits.

It should be noted that seasonal splitting is not intended or expected to change the total amount of harvest, only alter harvest distribution. As a result, benefits narrowly associated with the total quantity of harvest would not be expected to be affected by seasonal splitting. It is expected, however, that allowing the harvest of the full quota or ACL, as would be the expectation of the reallocation of harvests across the seasons and resultant open months, would result in increased social and economic benefits.

Alternative 1 (No Action) would not change either the fishing year, establish split seasons, establish a spawning season closure, close fishing with pots prior to complete harvest of the quota, or make any other management changes for the black sea bass component of the snapper grouper fishery. As a result, **Alternative 1 (No Action)** would not be expected to result in any change in fishing behavior, harvest patterns, or associated social benefits to fishermen or associated businesses or communities. **Alternative 1 (No Action)** would be expected to result in persistence and possible worsening of derby conditions and accelerated recreational closures, and associated declines in social and economic benefits. As described in **Section 4.1.1**, the commercial quota would be expected to be met as early as December to as late as May (**Table 4-3**), depending on whether future harvest conditions most resemble those of the 2009 fishing year (June 2009 through May 2010) or those of the 2007 fishing year (June 2007 through May 2008), resulting in a closure of this component of the snapper grouper fishery of as long as five months.

With implementation of Amendment 17B, the recreational black sea bass ACL would be projected to be harvested in February, resulting in a closure of approximately three months. Significant overlapping closures during these periods include red snapper for both sectors (all months), shallow water grouper for both sectors (January through April), vermilion snapper for the recreational sector (January through March), red porgy for the commercial sector (January through April), and greater amberjack for the commercial sector (April). As previously stated, the greater the amount of overlap of closures for different species, the greater the potential reduction in total social benefits because of reduced substitution possibilities.

The various management alternatives considered for black sea bass are designed to accomplish different objectives and, as a result, should only be compared within common objective groups. **Alternatives 2-6** and **9-11** attempt to counter the recent increased rate of black sea bass harvest (derby effects), **Alternatives 7 (Preferred)** and **8** address the disposition of unused portions of the commercial ACL, **Alternative 12** and sub-alternatives are intended to enhance the health of the resource by protecting spawning fish, and **Alternative 13** and sub-alternatives are intended to enhance social and economic benefits by extending the period during which recreational harvests can occur. In practice, a spawning season closure would obviously affect the timing of harvests (no harvest would be allowed during the closed period), but could also reduce the pace, as well as the total amount, of harvest over the entire course of the year. However, the primary purpose of a spawning closure is to enhance resource protection through protecting adults while they spawn and, if adopted, would not be intended to alter the pace or total amount of harvest, which would be the purpose of trip limits or gear closures.

The trade-offs of the alternatives designed to reduce the derby effects are balancing the benefits of a longer open season with the adverse effects of the restrictive measures imposed to lengthen the season. As seen in **Section 4.1.1**, the more restrictive the trip limit, the longer the season would be expected to remain open, absent an increase in the number of trips to compensate for the reduced limits. It is noted, however, that the projected closure dates provided in **Section 4.1.1** vary only by a little more than one month if the 2009 fishing year conditions persist and all the alternative trip limits considered may result in a substantial closure of the commercial sector. However, limiting harvests per trip, as would occur under **Alternative 2**, regardless of the sub-alternative chosen, would be expected to alter the profitability of some trips. In order for a trip limit to be effective in reducing the pace of harvest, it must reduce the harvest of that species on some trips. This could result in increased harvest of this species on other trips by the same or other vessels, or increased harvest of other species as compensation, with potentially deleterious effects on these species or other fishermen who typically harvest these species. Normally, however, even with compensation, the expectation is that total trip revenues are reduced for some fishermen, jeopardizing normal fishing behavior, revenues, and social benefits. The potential economic effects of the proposed black sea bass trip limits are described in **Section 4.1.2**, noting that these estimates do not incorporate potential compensating effort or harvest behavior. In general, it is assumed for the purposes of this discussion that the greater the economic losses, the greater the social losses. Beyond this assumption, available data does not support a definitive determination of which alternative trip limit would be expected to result in greater social benefits.

Alternative 3 (Preferred) and **Alternative 4** would attempt to reduce the adverse social and economic effects of a protracted closure of the commercial black sea bass component of the snapper grouper fishery through splitting the commercial fishing year into two seasons and specifying a commercial ACL for each season. Recall that under **Alternative 1 (No Action)** the commercial quota could be expected to be taken as early as December, as occurred in the most recent fishing year, resulting in no commercial black sea bass commercial harvests for more than five months (part of December and all of January through May). As shown in **Section 4.1.1**, based simply on the total number of days or months commercial black sea bass harvest would be allowed, **Alternative 3 (Preferred)** would not be expected to result in greater social benefits than **Alternative 1 (No Action)** because each seasonal ACL would be expected to be met (see **Table 4-6**), resulting in a total closure equal to or possibly exceeding the expected closure under **Alternative 1 (No Action)**.

The situation is similar under **Alternative 4**, though the total expected closure is reduced. As a result, both **Alternative 3 (Preferred)** and **Alternative 4** may result in reduced social benefits compared to **Alternative 1 (No Action)**. It should be noted that neither **Alternative 3 (Preferred)** nor **Alternative 4** would be expected to have any effects on the social benefits to the recreational sector.

Alternatives 5 and **6** also attempt to extend the total number of days commercial black sea bass harvests can occur, similar to **Alternative 3 (Preferred)** and **Alternative 4,** but do so through both proposed changes in the fishing year as well as the establishment of seasonal commercial ACLs. As a result, **Alternatives 5** and **6** would be expected to result in social effects on both the commercial and recreational sectors.

Alternative 5 may result in a shorter total closure in the commercial sector and resultant increased social and economic benefits compared to **Alternative 1 (No Action)**. Black sea bass harvest would be expected to remain prohibited in most of the winter under both **Alternative 1 (No Action)** and **Alternative 5**. However, harvest could resume in May under **Alternative 5** at the expense of a closure in October. While this substitution would not reduce competing closure overlaps, the commercial sector would be expected to experience shorter continuous closures, reducing the jeopardy to maintaining revenue flows and markets.

For the recreational sector, **Alternative 5** would not be expected to significantly alter the total period of potential closure relative to **Alternative 1 (No Action)**, with the recreational sector still projected to be closed more than three months. However, the closure would be expected to occur in July through October under **Alternative 5** rather than in January through May under **Alternative 1 (No Action)**. Shifting the closure to a different time period would be expected to have distributional effects, with any adverse social effects, as well as social benefits, likely accruing to different fishermen and associated businesses and communities. It should be noted that there may be more alternative recreational options available during the summer and early fall months than in the winter, which might mitigate any reduction in social benefits under **Alternative 5**. Despite any distributional effects, a reduction in overlapping closures would be expected, with black sea bass able to be harvested in January through part of March when the harvest of red snapper, shallow water grouper, and vermilion snapper is prohibited. As previously stated, any reduction in overlapping closures would be expected to increase angler flexibility to fish for alternative species, and increase social benefits.

Alternative 6 would be expected to result in a longer total closure in the commercial sector than under **Alternative 5** and a closure of either equal total duration or longer duration than under **Alternative 1 (No Action)**. As a result, **Alternative 6** would be expected to result in reduced social benefits to the commercial sector compared to **Alternative 5**, but potentially no change to a reduction in social benefits relative to **Alternative 1 (No Action)**. **Alternative 6** would be expected to result in a longer closure than **Alternatives 3** and **4** if 2009 fishing conditions persist and, as a result, would be expected to result in lower social benefits. Under average conditions, across 2006 through 2009, Alternative 6 would be expected to result in a longer total closure than **Alternative 4** and approximately an equal total closure as **Alternative 3 (Preferred)**, and assumed comparable social benefits.

For the recreational sector, **Alternative 6** may result in a total closure that is longer than the expected closure relative to both **Alternative 1 (No Action)** and **Alternative 5**. As a result, from the perspective of the total length of the closure, **Alternative 6** would be expected to result in lower social benefits to the recreational sector than **Alternative 1 (No Action)** and **Alternative 5**. Similar to **Alternative 5**, **Alternative 6** would be expected to result in distributional issues associated with the redistribution of social benefits and social costs with the expected closure changing to August through December rather than the status quo closure of winter through early spring under **Alternative 1 (No Action)**. A substantial portion of the expected closure under both **Alternative 5** and **Alternative 6** would overlap, specifically August through October. However, **Alternative 6** would help reduce overlapping closures for other species relative to both **Alternative 1 (No Action)** and **Alternative 5** and, as a result, would be expected to result in increased social benefits associated with increased harvest flexibility. The net outcome of the increased social benefits from increased harvest flexibility and the reduced social benefits associated with the longer closure are unknown.

Alternative 7 (Preferred) and **Alternative 8** would allow any unharvested portion of the commercial ACL to be carried forward into the next portion of the season **(Alternative 7 (Preferred))** or the next fishing year **(Alternative 8)**. The commercial ACL (as well as the total recreational and commercial ACL) is based on assessment of the health of the resource, rebuilding considerations, when appropriate, and considerations of the economic and social effects of different harvest levels. In general terms, the ACL represents the level of harvest that would be expected to maximize the social and economic benefits of the fishery while accounting for the biological condition of the resource. From this perspective, prevention from harvesting the full ACL, as would occur if harvest underages are not allowed to be carried forward, would be expected to result in a reduction in social and economic benefits. Although there may be some stock benefits from not harvesting the full ACL, such as the creation of a healthier resource or faster recovery of a resource that is rebuilding, where relevant, such benefits have already been determined to not result in greater social or economic benefits to society, otherwise these considerations would have been systematically incorporated into the determination of the ACL. For example, if the social and/or economic benefits were expected to be increased as a result of harvesting 100,000 fewer pounds of a species, then the ACL for that species would have been set 100,000 pounds lower. In summary, **Alternative 8** would be more flexible than **Alternative 7**

(Preferred) because it would also allow underages to be carried forward into the next fishing year and would, as a result, be expected to result in greater social benefits than **Alternative 7 (Preferred).** Both alternatives would be expected to result in greater social benefits than **Alternative 1 (No Action)**.

In addition to these considerations, **Alternative 8** could result in additional problems that, while administrative in nature, may precipitate some reduction in social benefits. ACLs are, as their name implies, annual catch limits. Exceeding an ACL triggers AMs and it is generally expected that AMs result in reduced short term social and economic benefits. If unharvested portions of the ACL from one fishing year are carried forward into the next, the resulting total harvest in the new year could exceed the ACL for that year. Such is not a certainty because sequential underharvesting could still occur, but any carry-over would increase the likelihood of exceeding the ACL for that year. While this would appear to be an administrative problem with potential administrative solutions, a failure to implement an appropriate solution may result in not only the reduced social benefits accruing to triggering the AMs but also additional adverse social effects associated with dissatisfaction with the management process.

Alternatives 9 and **10** would be expected to result in re-allocation of some portion of the black sea bass harvests, and associated social and economic benefits, from pot vessels to hook-and-line or other gear-type vessels because once the appropriate harvest thresholds have been reached, access to black sea bass would be limited vessels that do not use pots. While this may reduce any adverse social effects associated with bycatch problems for these other vessels, which are primarily hook-and-line vessels, the reductions in social benefits to pot vessels should not be discounted. Reducing access to black sea bass to these other vessels may also provide an incentive for these vessels to change their effort patterns and increase their fishing for black sea bass. If this occurs, functional re-allocation of the benefits associated with black sea bass harvest would be even greater. In summary, from a harvest perspective, pot fishermen and associated businesses and communities would be expected to experience a reduction in social and economic benefits under **Alternative 9**, while fishermen, businesses, and communities associated with other gears would be expected to experience an increase in social and economic benefits. Because of the higher threshold, **Alternative 9** would be expected to result in potentially greater re-allocation of social benefits than **Alternative 10**.

Both **Alternatives 9** and **10** would be expected to result in more total fishing days than the comparable **Alternatives 3 (Preferred)-6**. This may not be intuitively obvious looking at the results in **Tables 4-6a-b, 4-7a-c**, and **4-8** because in most instances (the single exception is **Alternative 9** in combination with **Alternative 4**) the second season would be expected to close earlier under **Alternatives 9** and **10** than under the comparable **Alternatives 3 (Preferred)-6**. However, the total number of fishing days would be greater because no total closure would occur during the first season under **Alternatives 9** or **10**, whereas closures would be expected in both seasons under each of **Alternatives 3 (Preferred)-6.** The gain in total fishing days, however, as should be obvious, is at the expense of the pot fleet, so the expected re-allocation of social benefits under **Alternatives 9** and **10** arise from both a potential reduction in harvest (harvest reduction is not certain because increased pot harvests in the second season could compensate for harvest prohibitions during the first season) and a certain reduction in fishing days. However, some level of continuous market flow could occur under **Alternatives 9** and **10** that could not occur under **Alternatives 3-6** because of the first season closures under **Alternatives 3 (Preferred)-6**.

Because of the trade-offs in social benefit flow under **Alternatives 9** and **10** (i.e., re-allocation of harvests and fishing days from pot vessels to vessels using other gear, increased total fishing days, but decreased days for pot vessels), it is not possible to rank these alternatives based on available data.

Alternative 11 would be expected to result in issues common to **Alternatives 9-10** and would, as a result, be expected to result in reduced social benefits. The most obvious common issue would be the re-allocation of harvests and associated social benefits from pot vessels, and associated businesses and communities, to vessels harvesting black sea bass using other gear. Available data does not allow determination of whether social benefits are increased by taking harvests away from the pot fleet and re-allocating them to vessels using other gears. Absent such information, it is assumed changes in the status quo distribution of harvest would reduce social benefits. Additional reduction in social benefits would be expected if closure of the pot fleet results in the full ACL not being harvested and it is not obvious that vessels using other gears would have the capacity, particularly if black sea bass remain an incidental harvest species for these vessels, to harvest the remaining 10% of the ACL (approximately 31,000 pounds under the current ACL) during the remaining portion of the fishing year. **Alternative 11** would be expected to result in more total fishing days but, similar to **Alternatives 9** and **10**, any additional days would be to the benefit of non-pot vessels at the expense of the pot fleet. Allowing vessels with other gear to continue to keep black sea bass longer through the year would also be expected to reduce bycatch mortality associated with protracted closed seasons. If any reduced bycatch mortality results in a healthier resource and subsequent increased harvests, then **Alternative 11** would be expected to result in increased social benefits from this perspective.

Because a spawning season closure would be expected to result in better protection of the reproduction capabilities of a resource, the health and sustainability of the resource would be expected to be enhanced. As a result of the enhanced resource protection and a healthier sustainable resource, long-term social and economic benefits would be expected to increase.

The proposed black sea bass spawning closure is intended to enhance the opportunity for mature fish to spawn and is not intended to affect (reduce) total mortality; fishermen would be expected to change their fishing patterns, resulting in shifted black sea bass effort and harvests to the remaining open period, to the extent such is possible/practical, and normal total harvests. While such behavioral change would not be expected to have a substantive effect on total benefits associated with black sea bass harvests, some distributional effects may occur if the effort shift results in changes in activity (including species mix of commercial landings and recreational service demand) across ports, communities, dealers, or associated businesses. However, because total harvest and activity is not expected to be substantively affected, no significant direct effects on social benefits associated with black sea bass harvests would be expected.

However, total black sea bass harvests, and associated social and economic benefits, could be reduced if the length or timing of the closure makes it difficult to fully compensate or shift harvests to another period, or concurrent closures for other species severely limit substitution opportunities during the closed period. Some fishermen may prefer to have closures for multiple species overlap, allowing them to take scheduled breaks, concentrate more on vessel/gear maintenance, or engage in other activities. Other fishermen may need or prefer to fish every month and prefer closures for primary target or revenue species not overlap so that one or more alternative key species are available year-round. The longer the closure, the larger the amount of harvest that likely will need to be shifted to remaining open months. Similarly, the longer the closure, the greater the potential overlap with closures for other key species. If the black sea bass spawning closure results in an inability for the full quota to be harvested, or occurs when opportunities to harvest other species are limited, increased jeopardy to fishing businesses could occur, with the associated loss of social and economic benefits that accrues to increased personal stress and business failure.

Other factors to consider in the decision to establish a spawning closure are whether a spawning closure is appropriate from a biological perspective for the resource (i.e., is spawning sufficiently seasonal that protection is warranted), or appropriate from a management perspective (spawning may be seasonal, but the species may spawn, on average, at a smaller size than is harvested, such that sufficient spawning occurs prior to harvest and a closure may not be necessary from this perspective; however, spawning closure benefits could still accrue if the current fishery is affecting sex ratios), and identifying the appropriate period. Selecting the appropriate period to close from a biological perspective increases the likelihood that the long-term biological benefits, and associated social and economic benefits, will be realized. As discussed in **Section 4.1.1**, seasonal spawning does appear to occur for black sea bass, a spawning closure is appropriate from a management perspective, and peak black sea bass spawning is believed to occur in March through May, with most spawning occurring in March and April.

The alternative proposed spawning closures will be discussed from the perspective of the potential effects discussed above and it is assumed that a spawning closure is appropriate for black sea bass. Because **Alternative 1 (No Action)** would not establish a spawning closure, no change in fishing activity or patterns, or associated social and economic benefits, would precipitate. However, black sea bass would not receive the stock benefits that a spawning closure may provide and, assuming these would translate into a more stable and sustainable resource, **Alternative 1 (No Action)** would be expected to result in reduced long-term social benefits than an appropriate spawning closure.

Because **Sub-Alternative 12a** would close the fishery during the two months when most spawning is expected to occur, March and April, most of the potential spawning protection benefits would be expected to be realized. Among the alternatives considered, only **Sub-Alternative 12c** would be expected to result in greater spawning protection. Based on 2006-2009 fishing-year data, on average, approximately 15% of the total ACL (see **Table 4-9**) is harvested in March-April, and would have to be shifted to open months. Recreational anglers would be expected to bear a greater proportionate burden of affected harvest than commercial fishermen under all scenarios considered (**Sub-Alternatives 12a-d**). Corresponding closures during this period would be shallow water grouper and red snapper for both months and both sectors, vermilion snapper for the recreational sector in March, greater amberjack for the commercial sector in April, and red porgy for the commercial sector in March and April (the harvest of goliath grouper and Nassau grouper is also prohibited year-round for both sectors, but neither species has been subject to recent harvest activity and, therefore, are not considered relevant to further consideration).

Sub-Alternative 12b would be expected to result in reduced spawning protection, and associated long-term social benefits, than **Sub-Alternative 12a**, while slightly increasing the amount of black sea bass harvest needed to be shifted, approximately 16% of the total ACL (see **Table 4-9**), increasing the possibility of foregone harvests and reduced social and economic benefits. However, the vermilion snapper closure for the recreational sector would no longer overlap the black sea bass closure, increasing substitution opportunities.

As previously stated, of the alternatives considered, **Sub-Alternative 12c** would be expected to result in the greatest spawning protection, but the 3-month closure would require the largest shift of harvests, approximately 24% of the total ACL (see **Table 4-9**) to the remaining months to maintain total harvest, and the largest possibility of foregone harvests and reduced associated social and economic benefits. No additional overlapping closures would be encountered by extension of the closure into May, and access to the shallow water grouper fishery would be available in May, increasing substitution opportunities, and associated benefits, for both sectors.

Sub-Alternative 12d would be expected to result in the least spawning protection and associated social and economic benefits. Less than 10% of black sea bass average annual harvests would have to be shifted to open months (see **Table 4-9**), increasing the likelihood that benefits associated with harvesting the ACL would not be foregone. The only potentially significant overlapping closure under **Sub-Alternative 12d** would be red snapper for both sectors.

It should be noted that in the previous discussion, unharvested ACL is assumed to result in foregone social and economic benefits. While there may be stock benefits associated with not harvesting the ACL, this assessment assumes that the assigned ACL sufficiently accounts for the biological needs of the resource, with appropriate harvest buffer, such that any unharvested portion of the ACL will not result in increased long-term harvests or associated social and economic benefits. As a result, not allowing the fishery to harvest the full ACL will only result in reduced benefits.

In summary, each of **Sub-Alternatives 12a-d** would be expected to result in increased spawning protection relative to **Alternative 1 (No Action)** and associated long-term social and economic benefits. **Sub-Alternative 12a** would be expected to result in greater social benefits than **Sub-Alternative 12b** because it would close what appear to be the more appropriate spawning months, even though the amount of transferred black sea bass harvest would be similar and **Sub-Alternative 12b** would result in less closure overlap with other species. **Sub-Alternative 12c** would be expected to result in the greatest social benefits associated with resource protection, but may result in the highest likelihood of the full ACL not being harvested, resulting in foregone short-term social and economic benefits. **Sub-Alternative 12d** would require the least behavioral changes by black sea bass fishermen and the least potential shore-side adjustments by associated businesses and communities, but would be expected to result in the least spawning protection and associated long-term social benefits.

Although there may be some differential biological effects of the alternative bag limits proposed in **Sub-Alternatives 13a-e**, for example, lower bag limits may increase discards, longer open seasons allow fish to be retained rather than discarded, cancelled trips may reduce the harvest of multiple species, etc., the intent of lowering the bag limit is to reduce the length of any ACL-related closure that might otherwise occur. The ACL-related closure in the 2010/2011 fishing season will be over three months long. It is expected that any longer open season that may result from a lower bag will result in greater social (and economic) benefits than a shorter open season resulting from a higher bag limit. The intent of the action, therefore, is to increase the social and economic benefits associated with extending the season and not specifically improve the biological condition of black sea bass or any other species, and receive any increased social or economic benefits associated with said improvement. As a result, the context of the following discussion assumes biological neutrality of the alternative bag limits, though the possibility of some biological effects, both positive and negative, with associated social and economic effects, should not be completely dismissed.

Examination of the social effects of changing the black sea bass recreational bag limit is a two-tiered exercise, first comparing the benefits of any reduction in the bag limit with the status quo, followed by comparing the alternative reductions. Although per-trip benefits would be expected to be greater under a higher bag limit (larger harvests result in a higher quality trip), a zero bag limit, combined with prohibitions on the harvest of other species, would be expected to increase the likelihood of trip cancellations, in favor of other recreational activities. Extending the season through a reduction in the bag limit is based on the expectation that the loss of benefits associated with these cancelled trips would be greater than the reduced benefits associated with fishing under the reduced bag limit. Although these results cannot be quantitatively estimated with any degree of certainty with available data, the assumptions are reasonable. As a result, a reduction in the bag limit that results in a longer open season would be expected to generate more social benefits than the status quo. A caveat to this determination, however, should be noted. It is possible that a lower bag limit adopted to extend the season is overly restrictive for some anglers; some anglers may not need a zero bag limit to stop fishing. If trips are cancelled in response to the lower limit, social benefits will be lost from both trips that continue to be taken under the lower limit (lower quality trips) as well as from cancelled trips that would otherwise have been taken under the higher limit. It is also possible that no net change in the number of trips taken occur if the number of cancelled trips equals the number of trips taken during the "re-opened" portion of the season.

Comparing alternative bag limits usually involves examination of the resultant expected season lengths, and associated benefits. This action considers five alternative bag limits. However, these bag limits were not generated from the perspective of generating different season lengths but, rather, three bag limits – seven fish, five fish and three fish - are based on achieving the same goal, no ACL-related closure, under different assumptions of baseline fishing conditions, while the remaining two bag limits – two fish and one fish - simply take the possible reductions to their extreme limit. As explained in **Section 4.1.1**, **Sub-Alternative 13a** would be expected to approximately result in no ACL-related closure if fishing conditions match those of the 2008/2009 fishing season, **Sub-Alternative 13b (Preferred)** those of the 2009/2010 season, and **Sub-Alternative 13c** those of the 2010/2011 estimated season. From this perspective, each of **Sub-Alternatives 13a-13c** would be expected to roughly achieve the same goal, with presumed equivalent benefits if the matching baseline conditions occur. As a result, comparison of the sub-alternatives from the perspective of season length, and associated benefits, is not appropriate other than noting, again, that the lower the bag limit to extend the season, the greater the likelihood that some fishing trips will be cancelled because of an overly restrictive bag limit at the personal level, with associated loss of social and economic benefits. Because they would establish the most severe reductions from the current bag limit, **Sub-Alternatives 13d** and 13**e** would be expected to be most likely to result in trip cancellations during the open season. In addition to the loss of benefits associated with the cancelled trips themselves, social benefits may also be lost if the new bag limit is smaller than necessary to extend the season because potential reduced effort (trips cancelled as a result of the reduced limit) was not factored into its calculation. Because **Sub-Alternative 13e** would impose the lowest bag limit, it would be expected to be most susceptible to interactions of this type and, subsequently, potentially result in the least social and economic benefits.

While a direct examination of season length is not appropriate (see below for an indirect comparison of season length), it is appropriate to conduct a comparison of the alternative bag limits from the perspective of the effects if unexpected baseline fishing conditions occur. For example, what would be the expected effects of adopting **Sub-Alternative 13a**, a 7-fish bag limit, but encountering 2010/2011 fishing conditions? The general expectation is that the social and economic benefits will be maximized if fishery conditions match those on which the adopted bag limit was based. From this perspective, a limit that is more restrictive than necessary to prevent an ACL-related closure would be expected to result in foregone social and economic benefits, while an insufficiently restrictive limit would also be expected to result in foregone social and economic benefits because the season would not be expected to remain open for the full fishing year.

With regards to the selection of assumed baseline conditions, absent information to suggest otherwise, such as changing environmental, regulatory, or other conditions, it is logical to expect that near-term future conditions will most closely mirror those of the more recent past. From this perspective, 2011/2012 and subsequent years may be more likely to mirror 2010/2011 fishing conditions than conditions from earlier years (i.e., 2008/2009 or 2009/2010). While forecasts based on the earlier fishing years would lower the expected necessary reduction in the bag limit, the adoption of overly optimistic assumptions and associated bag limit could precipitate dissatisfaction with managers and the management process if they prove incapable of achieving the expected goals.

With respect to constituent satisfaction with the management process, while managers are expected to make logical decisions using the information on hand, they have discretion in selecting their goal. As discussed above, the alternative bag limits were all calculated to achieve the same goal of eliminating an ACL-related seasonal closure and vary only by the assumption of baseline fishing conditions. The Council could, however, decide that some ACL-related closure is acceptable, opting for a bag limit that would be expected to shorten, but not necessarily eliminate, an ACL-related closure. This is what might be described as an indirect comparison of season lengths. If all of the alternatives considered would be expected to result in no seasonal closure if the associated baseline conditions occur, logic dictates that "mis-pairing" would result in variable season lengths. While it is certainly possible that a bag limit be so severe as to keep the season open but not allow full harvest of the ACL, the more interesting possibility is deciding some period of closure is acceptable under a higher bag limit. For example, based on current analysis, a 7-fish (**Sub-Alternative 13a**) or 5-fish bag (**Preferred Sub-Alternative 13b**)limit would not be expected to keep the season open the entire fishing year if 2010/2011 fishing conditions occur. However, either higher limit (i.e., higher than 3 fish, which is the bag limit "paired" with 2010/2011 fishing conditions) would be expected to extend the season relative to the status quo. The Council could determine that some, though not full, extension of the season is preferable to no closure under the most restrictive limit. Such a decision would presumably be based on an expectation that the social and/or economic benefits would be increased relative to the more severe bag limit and no closure.

Finally, it should be noted that consideration of the baseline conditions should include consideration of the adoption of a spawning closure, as proposed by **Alternative 12**. While considerations of reducing the bag limit versus a spawning closure have different objectives, the adoption of a spawning closure would reduce the extendable period of the season (based on the current season in which over three months of the season will be subject to an ACL-related closure, from one to three months of this period have been proposed to protect spawning), thereby reducing the potential severity of any reduction in the bag limit, as described in **Section 4.1.1**. Overlap of the two alternatives – a spawning closure to improve biological health and a reduction in the bag limit to extend the season – requires consideration of the trade-offs of improved stock conditions versus increased fishing opportunities and the final selection of preferred alternatives would be expected to be the combination that maximizes the social and economic benefits of these trade-offs.

See **Section 3.7.3** for discussion on the number of potentially affected communities and dealers with recorded black sea bass landings in 2008. The discussion of environmental justice considerations is provided in **Appendix D**.

4.1.4 Administrative Effects

Administrative effects for **Alternative 1 (No Action)** would be the least of all the alternatives considered. **Alternative 2** would require the specification of a trip limit and the preparation of subsequent trip limit reduction and/or closure notices. **Alternatives 3 (Preferred), 4, 5**, and **6**, would all require monitoring two separate fishing seasons, and therefore, the distribution of two ACL closure notices. Therefore, **Alternatives 3 (Preferred), 4, 5**, and **6**, would similarly increase the administrative burden when compared with **Alternative 2**. The cost and time associated with implementing **Alternatives 7 (Preferred)** and **8** would be added to **Alternatives 3 (Preferred)-6**, and thus increase the administrative burden for those alternatives overall. Constantly carrying over unused portions of the ACL to other seasons or fishing years could be cumbersome given the issues with landings and data reporting time lags. **Alternatives 9** and **10** would be the most administratively burdensome of all the alternatives considered. **Alternatives 9** and **10** would require projecting when either 100,000 or 50,000 pounds is left to be harvested, at which point a notice informing sea bass pot fishermen the pot fishery is closed would be distributed. Enforcement efforts may be complicated under **Alternatives 9** and **10** if it is not clear when the pot fishery is closed and what other gear types are allowed during the sea bass pot gear closure. There also could administrative difficulties in monitoring small amounts of the quota under **Alternatives 9** and **10**. **Alternative 11** would not result in additional cost or administrative effort over the current situation since it would simply require continued monitoring of the ACL, and distribution of a closure notice to the pot sector when 90% of the ACL is projected to be met. However, after 90% of the quota is met, it could be administratively difficult to monitor the remaining 10% of the quota and predict a closure date. Spawning season closures included under **Alternative 12** would not require increased time, enforcement, or funds over the status quo, other than issuing a reminder notice of the spawning season closure if necessary. Because there is currently a bag limit in place for black sea bass, simply reducing the number of fish allowed to be kept per person (**Alternative 13**) would not add or detract from the status quo administrative burden. Enforcement of the bag limit would still be required at the lower level, and no additional cost or time burdens would result from the implementation of a reduced black sea bass bag limit.

4.1.5 Council Conclusions

<u>Commercial Trip Limit for Black Sea Bass</u>
Trip limit alternatives for the black sea bass fishery were considered as a tool to keep the commercial fishery open for a longer period of time. The Council's Snapper Grouper Advisory Panel (AP) expressed support for the Council to consider trip limits in Regulatory Amendment 9 but did not have a specific poundage recommendation.

Some members of the public expressed their support for commercial black sea bass trip limits, especially in North Carolina. Others stated that a trip limit would not be profitable since only the 1,250-pound trip limit alternative would have extended the fishing season enough. Fishermen would then be forced to make more trips and thus be unable to maintain the same level of profit. In addition, the Council received comments indicating less support for commercial black sea bass trip limits than when Regulatory Amendment 9 began to be developed due to proposed effort control alternatives in Amendment 18A.

The Socio-Economic Subpanel (SEP) of the Council's Scientific and Statistical Committee (SSC) expressed concern about the use of trip limits:
The SEP does not recommend the use of trip limits. Our primary concern with utilizing trip limits is that fishermen will increase their number of fishing trips to maintain a constant level of total revenues. The real change in the system will result from an increase in operating costs. The analysis focuses on revenue losses and we suggested that an alternative approach be used to estimate the economic impact of the trip limits. This approach would estimate average trip costs and then project those costs out as fishermen increase their trips to accommodate the trip limit restriction. We also anticipate this regulation will adversely impact the larger vessels to the advantage of the smaller vessels because the trip limit restriction is less binding for the smaller vessels. We feel this will only marginally increase the length of the season at the expense of increased physical risk and economic cost.

The Council's Law Enforcement Advisory Panel (LEAP) recommended consideration of trip limits based on numbers of fish as opposed to pounds. However, the LEAP did not express concerns over the enforceability of trip limits as they are currently proposed.

Based on the input received during public hearings, from the AP, from the SEP and SSC, and the fact that the stock is currently undergoing an assessment (SEDAR 25) -- the results of which will be available by the end of 2011-- the Council chose not to implement trip limits for the black sea bass fishery at this time.

Modification to the Fishing Year and Split-Season Commercial Quota
Amendment 13C (SAFMC 2006) established a June 1 start date for the black sea bass fishing year for both the commercial and recreational sectors with the intent that, if a closure should occur, it would most likely coincide with the spawning season. The Council again considered a change in the fishing year as a possible means to extend the season in Regulatory Amendment 9. In addition, a split-season quota for the commercial sector would also be put into place.

The start of the fishing year can affect the amount of fishing pressure the stock experiences during its spawning season. Moreover, there is evidence that black sea bass spawn later in the year in more northern latitudes. The Council realizes that the timing of closures is critical and affects different states disproportionately: a January start date would benefit fishermen in Georgia and Florida whereas a June start date is more advantageous for fishermen in the Carolinas. For this reason, the Council intends to consider a regional approach to management of black sea bass in a future amendment. The Snapper Grouper AP strongly supports a regional approach to management of the black sea bass fishery.

No recommendations on modifications to the fishing year were provided by the SSC or the LEAP.

The Council ultimately chose to retain the June-May fishing year and implement a June-November and December-May split-season quota for the commercial fishery for the time being while the stock assessment is completed. Concerns expressed by the recreational component of the fishery, particularly in North Carolina, supported this decision. Once management measures are reconsidered in late 2011 in response to the assessment, the Council will again discuss changes to the fishing year and other regulations on a regional basis.

The Council concluded the preferred alternative best meets the purpose and need to prevent the progressive shortening of the fishing season while ensuring equity in harvest opportunities, promoting safety at sea, and minimizing adverse socioeconomic impacts. The preferred alternative also best meets the objectives of the Snapper Grouper Fishery Management Plan while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

Carry-over of Unused ACL (Quota)
The Snapper Grouper AP supported **Preferred Alternative 7**. No recommendations were provided by the SSC or the LEAP.

Under the Council's preferred alternative to establish a split-season quota for the commercial fishery, a mechanism to address underages had to be considered. Carrying over the unused portion of the commercial ACL (quota) from the first part of the split season into the second part of the split season (**Preferred Alternative 7**) would ensure that fishermen had the opportunity to harvest the entire ACL (quota). However, adding the unused portion of the ACL (quota) to the following fishing year **(Alternative 8)** could result in the ACL for the following portion of the fishing year to be exceeded and trigger Accountability Measures. Furthermore, if the amount of ACL (quota) carried forward was large enough, the ABC or OFL could be exceeded and the fishery would be considered to be experiencing overfishing. Hence the Council chose **Preferred Alternative 7** as their approach to address underages under a split-season framework.

The Council concluded the preferred alternative best meets the purpose and need to prevent the progressive shortening of the fishing season while ensuring equity in harvest opportunities, promoting safety at sea, and minimizing adverse socioeconomic impacts. The preferred alternative also best meets the objectives of the Snapper Grouper Fishery Management Plan, including preventing overfishing, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

<u>Gear Restrictions</u>
The Snapper Grouper AP recommended that the Council consider specifying two commercial seasons, one in which all gears may participate and the other for all gears except black sea bass pots. Moreover, they suggested specifying the fishing years so that one of the seasons corresponds to the traditional winter pot fishery.

The Council chose **Alternative 11** (close the pot fishery when 90% of the quota has been met) as their preferred prior to public hearings following the recommendation of the Snapper Grouper AP. However, the NMFS SEFSC quota monitoring system currently in place cannot track quotas in a timely enough manner to allow projections at 90% of the ACL (quota). The Council stated that **Alternative 11** presented a desirable approach and reiterated their support for implementation of "Electronic Quota Monitoring" so that approaches such as this can be considered in the future. The Council selected to impose no gear restrictions on the black sea bass fishery at this time due to the lack of a timely quota monitoring system.

The Council concluded that taking no action on gear restrictions at this time best meets the objectives of the Snapper Grouper Fishery Management Plan while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

<u>Spawning Season Closure</u>
A spawning season closure was considered as a possible tool to extend the fishing season and benefit the stock. However, there was strong opposition from the public toward such a measure given additional proposed measures. While many fishermen are in favor of curbing harvest during the spawning season, they felt it would be best accomplished with a modification to the fishing year. Moreover, the black sea bass stock is under a rebuilding schedule, there are indications that the stock is rebuilding, and a stock assessment is currently underway. For the previous reasons, and in light of strong opposition from the public, the Council chose not to implement a spawning season closure for the black sea bass fishery a this time. The Snapper Grouper AP supported a spawning season closure but did not recommend a particular alternative.

No recommendations were provided on a spawning season closure by the SSC or the LEAP.

The Council concluded the preferred alternative best meets the purpose and need to prevent the progressive shortening of the fishing season while ensuring equity in harvest opportunities, promoting safety at sea, and minimizing adverse socioeconomic impacts. The preferred alternative also best meets the objectives of the Snapper Grouper Fishery Management Plan, including preventing overfishing, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

<u>Modification to the Bag Limit</u>

Following the closure of the recreational fishery on February 12, 2011, there was consistent public support for a lowering of the bag limit in order to extend the recreational fishing season. The Council also received requests to consider a change in the size limit. However, such a change would likely not have the desired effect because the black sea bass stock is rebuilding and larger fish are becoming more abundant. A smaller number of larger fish produces more in terms of yield. On the other hand, a bag limit reduction, if the bag limit is low enough, will lengthen the season but is not expected to have an immediate significant effect on avoiding closures. The Council intends to address the closures by considering management strategy modifications after the stock assessment is completed in late 2011.

The Southeast Fisheries Science Center (SEFSC) stated that, in a stock that is under a rebuilding schedule such as black sea bass, management is based on projections that maintain the stock on a trajectory to achieve the rebuilding goal. If there is a disruption early on in the rebuilding (such as an overage of the ACL), it tends to affect the rebuilding more than if the disruption occurs late in the trajectory. Therefore, if overages occur early on, larger cuts will have to be placed on future years' harvest. With that said, the SEFSC encouraged the Council to adopt a reasonably low bag limit at this time to ensure that harvest in the future will not have to be substantially curbed.

The Council's SSC did not provide input on the bag limit alternatives due to timing constraints. However, individual members of the SSC did submit comments for the Council's consideration. SSC members expressed their concern over the point estimates used to calculate economic effects not including a range such that the extent of the difference among the alternatives is difficult to quantify. In addition, the biological analysis for the bag limit alternatives stated that effects would be "biologically neutral".

The Council chose as their preferred alternative a reduction in the bag limit from 15 fish to 5 fish (**Preferred Sub-Alternative 13b**). Their decision was based on public support for a reduced bag limit and the fact that a large percentage of recreational trips result in approximately 5 black sea bass per person. Hence the Council considered this appropriate as an interim measure until the results of the stock assessment are available late in 2011. Data presented to the Council in March indicate that if the recreational ACL remains at 409,000 pounds gutted weight, it is projected that the season would close on March 6, 2012 assuming the 2011/12 catch rate is similar to the 2010/2011 catch rate. It is important to note that current regulations dictate that the recreational ACL be reduced by the amount of the overage during the following fishing season. At the same time, the black sea bass population is continuing to grow such that the encounters will be more frequent and individual fish will weigh more resulting in the ACL being reached sooner. All this points to a projected closing date sooner than March 6, 2012.

The Council's intent is to have this bag limit reduction in place by the start of the next fishing year on June 1, 2011. The Council recognizes that the recreational ACL for the 2011/12 fishing year that begins on June 1st will be reduced by the amount of the recreational overage and expects the reduced bag limit to help lengthen the season. If the bag limit reduction is not implemented by June 1st, the Council expects the season will close within the first couple of months of the new fishing year.

The Council concluded the preferred alternative best meets the purpose and need to prevent the progressive shortening of the fishing season while ensuring equity in harvest opportunities, promoting safety at sea, and minimizing adverse socioeconomic impacts. The preferred alternative also best meets the objectives of the Snapper Grouper Fishery Management Plan, including preventing overfishing, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

4.2 Trip Limit for Vermilion Snapper

Alternative 1 (No Action). Commercial ACL (quota) 618, 046 pounds gw (686,031 pounds ww) which is split into two ACLs (quotas), 315,523 pounds gw (350,231 pounds ww) during January-June and 302,523 pounds gw (335,800 pounds ww) during July-December. There is no commercial trip limit.

Alternative 2. Establish a 1,000 pounds gw (1,110 pounds ww) commercial trip limit.

Sub-Alternative 2a. Establish a 1,000 pounds gw (1,110 pounds ww) commercial trip limit and reduce to 500 pounds gw (555 pounds ww) when 75% of the ACL (quota) is met or projected to be met.

Alternative 3 (Preferred). Establish a 1,500 pounds gw (1,665 pounds ww) commercial trip limit.

Sub-Alternative 3a. Reduce the trip limit to 500 pounds gw when 75% of the commercial ACL (quota) is met or projected to be met.

Alternative 4. Establish a 750 pounds gw (833 pounds ww) trip limit.

Sub-Alternative 4a. Establish a 750 pounds gw (833 pounds ww) commercial trip limit and reduce to 400 pounds gw (444 pounds ww) when 75% of the commercial ACL (quota) is met or projected to be met.

Alternative 5. Establish a 500 pounds gw (555 pounds ww) commercial trip limit.

Alternative 6. Establish a 400 pounds gw (444 pounds ww) commercial trip limit.

4.2.1 Biological Impacts

Alternative 1 (No Action) would retain the measures established through Amendment 16 (SAFMC 2009a), which became effective on July 19, 2009. The measures include a 315,523 pounds gutted weight (350,231 pounds whole weight) quota during January-June and 302,523 pounds gutted weight (302,523 pounds whole weight) quota during July-December.

In July-December 2009, the 302,523 pounds gutted weight vermilion snapper was closed on September 18, 2009 but the quota was exceeded. Examination of logbook data indicates the quota would have been met on September 9, 2009 (**Table 4-28**). Using catch per trip information from the NMFS logbook, it was predicted in 2008 that the 302,523 pounds gutted weight quota would have been met on September 16, 2008. Therefore, the timing of the July-December quota closure would have been similar in 2008 and 2009. Further, the number of trips and magnitude of vermilion snapper landings during August 2008 and August 2009 was similar (**Table 4-29**). An increase in the number of trips and a corresponding increase in landings might have been expected following the implementation of new management regulations to reduce the vermilion snapper quota. The July-December 2010 quota was met on October 7, 2010.

Table 4-28. Date July-December 302,523 pounds gutted weight quota expected to be met.

Jan-June	Date quota met
July-Dec 2008	9/16/2008
July-Dec 2009	9/9/2009

Table 4-29. Number of trips and vermilion snapper landings (pounds gutted weight) during August 2008 and 2009.

August	2008	2009
trips	306	283
catch	132,644	131,796

During January-June 2010, the 315,523 pounds gutted weight quota was met on March 19, 2010. However, using 2009 catch per trip information from NMFS logbook, it was estimated the 315,523 pounds gutted weight quota would have been met on June 1, 2009 (**Table 4-30**). The earlier closure of vermilion snapper in 2010 did not appear to be the result of an increased number of trips but rather an increase in the catch per trip of vermilion snapper (**Table 4-31**). The average catch per trip during January-February 2010 was twice what it was during the same time in January-February 2009. There was a very slight decrease in the average length of a trip during January-February from 3.8 days in 2008 to 3.4 days in 2010. The increased catch per trip in January-February 2010 could have been a function of the vermilion snapper fishery being closed during October through December 2009 or greater efficiency in fishermen targeting vermilion snapper while other shallow water grouper is closed.

Table 4-30. Date January-June 315,523 pounds gutted weight quota expected to be met.

Jan-June	Date quota met
Jan-June 2009	6/1/2009
Jan-June 2010	3/19/2010

Table 4-31. Number of trips, catch per trip (pounds gutted weight) and landings (pounds gutted weight) during January-February 2008-2010.

Year	# trips	Mean/trip	Sum
2008	355	295	104,846
2009	322	325	104,749
2010	280	800	223,909

Alternative 1 (No Action) would not implement any regulations to slow down the rate at which the quota is being met for vermilion snapper and provide no relief to derby conditions that may be occurring. **Alternative 1 (No Action)** could have positive biological effects if effort is reduced for long periods of time including a portion of the time of peak spawning, which occurs during June-August. However, **Alternative 1 (No Action)** could also have negative biological effects when fishermen target co-occurring species and discard dead vermilion snapper. **Alternatives 2-6** provide a range of trip limits that could possibly prolong the vermilion snapper

fishing season. **Alternative 2, Sub-Alternative 2a**, and **Alternative 3 (Preferred)** were suggested by vermilion snapper commercial fishermen.

To determine the effect trip limits for vermilion snapper under **Alternatives 2-6**, it was necessary to estimate landings that would have occurred after the vermilion snapper was closed in September 2009 and March 2010, and to account for the increased catch per trip, which occurred in January-June 2010. This was done by using trip information from the NMFS logbook during June 2009 through March 2010. The missing values following when the quota was met were assumed to equal the average landings two months prior. Trip limits were applied to actual trips. For example, if the trip limit was 1,000 pounds gutted weight, the maximum landings on a trip was set to 1,000 pounds gutted weight.

Alternative 2 would establish a 1,000 pounds gutted weight trip limit for vermilion snapper. This alternative was suggested as a preferred management measure at the Snapper Grouper Advisory Panel meeting in June 2008. Establishing a 1,000 pounds gutted weight trip limit could be expected to extend the fishing season by about three weeks for both July-December and January-June (**Tables 4-32 and 4-33**). Reducing the trip limit from 1,000 pounds gutted weight to 500 pounds gutted weight after 75% of the ACL (quota) is met during July-December 2009 and January-June 2010 (**Sub-Alternative 2a**) would extend the fishing season by approximately two additional weeks. This is because many trips are below the 500 pounds gutted weight trip limit (**Table 4-34**). Establishing a 1,500 pounds gutted weight trip limit (**Alternative 3 Preferred**) could be expected to extend the fishing season by about one to two weeks during both July-December and January-June (**Tables 4-32 and 4-33**). Establishing a 1,500 pounds gutted weight trip limit that would be reduced to 500 pounds gutted weight when 75% of the quota is met (**Sub-Alternative 3a**) could extend the season by about a month during July-December and 3 weeks during January-June.

Table 4-32. Date 302,523 pounds gutted weight quota and 75% of quota would be met during July-December 2009.
Shaded area represents month when quota would be met.

Month	Alt 1	Alt 2 1,000 pounds	Alt 3 (Preferred) 1,500 pounds	Alt 4 750 pounds	Alt 5 500 pounds	Alt 6 400 pounds	Sub-Alt 2a 1,000 to 500	Sub-Alt 3a 1,500 to 500	Sub-Alt 4a 750 to 400
7	144,495	104,034	121,386	90,657	70,769	60,603	104,034	121,386	90,657
8	276,291	203,226	235,057	178,161	140,511	121,539	203,226	235,057	178,161
9	415,484	338,788	356,565	263,423	206,428	178,046	290,037	293,946	251,058
10	550,979	456,165	474,154	349,806	274,258	236,768	357,867	361,775	309,780
11	686,473	573,543	591,743	436,189	342,088	295,489	425,696	429,605	368,502
12	821,968	690,920	709,332	522,572	409,917	354,211	493,526	497,434	427,224
Date quota met	9-Sep	21-Sep	17-Sep	14-Oct	13-Nov	4-Dec	5-Oct	4-Oct	26-Oct
Date 75% of quota met	8-Aug	9-Sep	26-Aug	17-Sep					

Table 4-33. Date 315,523 pounds gutted weight quota and 75% of quota would be met during January-June 2009.
Shaded area represents month when quota would be met.

Month	Alt 1	Alt 2 1,000 pounds	Alt 3 (Preferred) 1,500 pounds	Alt 4 750 pounds	Alt 5 500 pounds	Alt 6 400 pounds	Sub-Alt 2a 1,000 to 500	Sub-Alt 3a 1,500 to 500	Sub-Alt 4a 750 to 400
1	161,817	104,114	128,353	87,725	66,459	56,066	104,114	128,353	87,725
2	223,909	149,132	182,505	126,338	96,819	82,133	149,132	182,505	126,338
3	361,330	272,672	318,316	238,944	190,555	163,503	264,922	293,071	238,944
4	481,773	363,562	424,421	318,592	254,073	218,003	328,441	356,589	299,229
5	602,217	454,453	530,526	398,240	317,591	272,504	391,959	420,108	353,729
6	722,660	545,343	636,631	477,888	381,110	327,005	455,477	483,626	408,230
Date quota met	20-Mar	14-Apr	29-Mar	28-Apr	29-May	23-Jun	24-April	11-Apr	9-May
Date 75% of quota met	3-Mar	22-Mar	12-Mar	29-Mar	21-Apr				

Alternative 4 would specify a 750 pounds gutted weight trip limit, which would be expected to extend the fishing by five weeks during the July-December 2009 and January-June 2010 fishing years. Reducing the trip limit to 400 pounds gutted weight when 75% of the ACL is met (**Sub-Alternative 4a**) would be expected to extend the fishing season by about two additional weeks. **Alternative 5** (500 pounds gutted weight trip limit) would have been expected to extend the June-December 2009 fishing season through November; whereas during January-June, this trip

limit might keep the season open through the end of May due to a lower number of trips and a greater percentage of trips being constrained by the trip limit (**Table 4-34**). Under the 400 pounds gutted weight trip limit specified in **Alternative 6**, the ACL would likely have been met in December for the June-December 2009 fishing and June during January-June 2010.

In the absence of any ACL, the expected harvest for July-December 2009 would have been 821,968 pounds gutted weight and the expected harvest for January-June 2010 would be 722,660 pounds gutted weight. When comparing expected landings to the seasonal ACLs of 302,523 and 315,523 pounds gutted weight, a reduction in harvest of 63% and 58% would be needed, for July-December 2009 and January-June 2010, respectively. **Table 4-34** shows that between a 400 and 500 pounds gutted weight trip limit would be needed to keep the fishery open for the whole fishing season.

Table 4-34. Trip limit, number of trips, amount of pounds (gutted weight), and percent reduction in harvest provided by a trip limit during June-December 2009 and January-June 2010.

	June-Dec 2009				Jan-June 2010			
Trip Limit	# Trips	% Trips	Pounds over trip		# Trips	% Trips	Pounds over trip	% Reduct
0	782	100.00%	384,597	100.00%	424	100.00%	315,547	100.00%
90	491	62.79%	332,151	86.36%	351	82.78%	281,097	89.08%
104	474	60.61%	325,652	84.67%	347	81.84%	276,381	87.59%
135	440	56.27%	311,266	80.93%	326	76.89%	265,814	84.24%
158	417	53.32%	301,559	78.41%	314	74.06%	258,620	81.96%
180	405	51.79%	292,314	76.01%	303	71.46%	251,689	79.76%
225	378	48.34%	274,730	71.43%	287	67.69%	238,512	75.59%
270	362	46.29%	258,084	67.11%	267	62.97%	226,078	71.65%
450	262	33.50%	202,666	52.70%	219	51.65%	182,920	57.97%
541	240	30.69%	180,173	46.85%	186	43.87%	164,899	52.26%
631	207	26.47%	160,043	41.61%	168	39.62%	148,892	47.19%
721	177	22.63%	142,675	37.10%	152	35.85%	134,524	42.63%
811	155	19.82%	127,987	33.28%	142	33.49%	121,234	38.42%
901	142	18.16%	114,653	29.81%	128	30.19%	109,102	34.58%
991	123	15.73%	102,599	26.68%	120	28.30%	97,938	31.04%
1,081	114	14.58%	91,869	23.89%	111	26.18%	87,551	27.75%
1,171	104	13.30%	82,180	21.37%	105	24.76%	77,751	24.64%
1,261	93	11.89%	73,082	19.00%	89	20.99%	69,124	21.91%
1,351	82	10.49%	65,231	16.96%	84	19.81%	61,317	19.43%
1,441	73	9.34%	58,199	15.13%	76	17.92%	54,218	17.18%
1,532	62	7.93%	52,192	13.57%	70	16.51%	47,748	15.13%
1,622	56	7.16%	46,814	12.17%	59	13.92%	42,091	13.34%
1,712	51	6.52%	42,046	10.93%	55	12.97%	37,043	11.74%
1,802	47	6.01%	37,597	9.78%	45	10.61%	32,548	10.31%
2,027	34	4.35%	29,205	7.59%	37	8.73%	23,249	7.37%
2,252	26	3.32%	22,811	5.93%	27	6.37%	15,961	5.06%
2,477	22	2.81%	17,503	4.55%	21	4.95%	10,544	3.34%
2,703	22	2.81%	12,548	3.26%	13	3.07%	6,563	2.08%
2,928	16	2.05%	8,086	2.10%	8	1.89%	4,040	1.28%
3,153	12	1.53%	4,988	1.30%	5	1.18%	2,539	0.80%
3,378	7	0.90%	2,739	0.71%	3	0.71%	1,645	0.52%
3,604	5	0.64%	1,413	0.37%	2	0.47%	1,084	0.34%
3,829	2	0.26%	626	0.16%	2	0.47%	633	0.20%
4,054	1	0.13%	262	0.07%	1	0.24%	326	0.10%
4,279	1	0.13%	37	0.01%	1	0.24%	101	0.03%

The dates specified in **Tables 4-32** and **4-33** do not consider some trips would be shortened by the trip limit and fishermen might increase the number of trips to compensate for a lower trip limit. It might be expected that with a decrease in the trip limit, there could be an increase in the number of trips. However, fuel costs and distance traveled to fishing grounds would also be a factor in whether or not a fishermen would increase the number of trips. With small trip limits, the cost of fuel moving to and from the fishing grounds could limit profit to the extent that the trip would not be taken. **Table 4-34** provides some indication of the percentage of trips greater than the proposed trip limits during July-December 2009 and January-June 2010. For example, approximately 34% of the July-December 2009 trips and 52% of the January-June trips had catches greater than 450 pounds gutted weight. Therefore, if the trip limit was set at 400 or 500 pounds gutted weight (**Alternatives 5** and **6**), and trips were profitable, an increase in the number of trips could be expected. About 15% of the July-December 2009 trips and 26% of the January-June trips had catches greater than 1,000 pounds gutted weight. Therefore, even with a larger trip limit, some increase in the number of trips could be expected.

Individuals from different states could prefer different trip limits depending on distance they have to run to fish for vermilion snapper and number of days at sea needed to make a trip profitable. Vessels that landed vermilion snapper in Georgia had the highest landings of vermilion snapper and spent the greatest number of days at sea. The shortest trip length and smallest average catch of vermilion snapper occurred in North Carolina (**Table 4-35**).

Table 4-35. Average number of days away and landings (pounds whole weight) of vermilion snapper for vessels that landed vermilion snapper during 2008-2009.

State	Observations	Variable	Mean
Florida	1,019	Days away	2.84
		Total pounds	533
Georgia	190	Days away	6.38
		Total pounds	1,319
South Carolina	1,114	Days away	5.95
		Total pounds	336
North Carolina	2,438	Days away	2.78
		Total pounds	375

Tables 4-36 to **4-39** and associated figures show vermilion snapper landed in respective states were generally caught offshore of those states. For fishermen who landed vermilion snapper in North Carolina, 17% were caught off of South Carolina. Therefore, some North Carolina fishermen are likely running fairly long distances before landing their catch. The shelf edge is fairly wide off of Georgia, as a result, longer trips and larger vermilion snapper catches may be due to the distance offshore fishermen travel to get to fishing grounds. In contrast, the shelf is fairly narrow off Florida, which may be responsible the fewer days at sea when compared to Georgia and South Carolina.

Table 4-36. Statistical grids identifying location where 96% of the vermilion snapper were caught and subsequently landed in NC.

Yellow area in figure shows where 69% of vermilion snapper were caught.

Grid	Percent	Cumulative Percent
3476	26.89%	26.89%
3377	25.41%	52.30%
3278	17.04%	69.34%
3179	8.80%	78.14%
3277	5.06%	83.20%
3474	3.99%	87.19%
3378	3.66%	90.85%
3477	3.10%	93.94%
3376	2.60%	96.54%

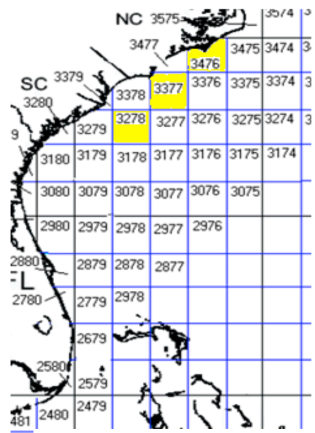


Table 4-37. Statistical grids identifying location where 98% of the vermilion snapper were caught and subsequently landed in SC.

Shaded area shows where 79% of the vermilion snapper were caught.

Grid	Percent	Cumulative Percent
3378	35.70%	35.70%
3279	25.64%	61.34%
3278	17.37%	78.72%
3377	7.97%	86.68%
3477	3.29%	89.98%
3179	2.82%	92.80%
3379	1.64%	94.44%
3180	1.49%	95.92%
3277	1.12%	97.05%
3376	1.01%	98.05%

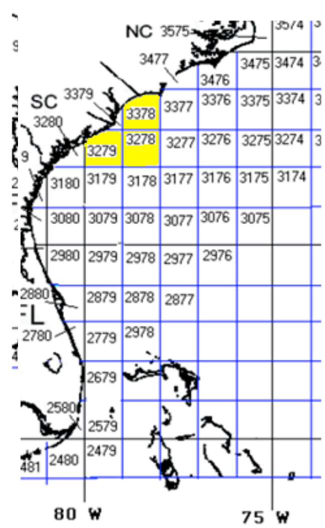


Table 4-38. Statistical grids identifying location where 90% of the vermilion snapper were caught and subsequently landed in GA.

Grid	Percent	Cumulative Percent
3080	39.87%	39.87%
3180	32.38%	72.25%
3179	17.98%	90.23%

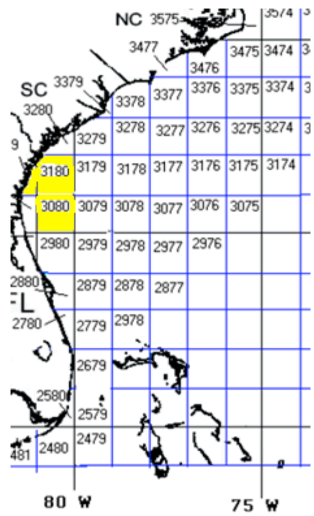
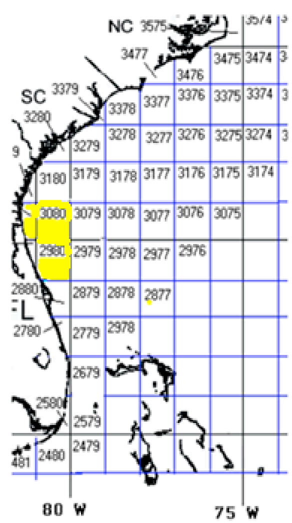


Table 4-39. Statistical grids identifying location where 97% of the vermilion snapper were caught and subsequently landed in FL.

Yellow area shows were 95% of the vermilion snapper were caught.

Grid	Percent	Cumulative Percent
3080	67.28%	67.28%
3081	14.82%	82.10%
2980	11.15%	93.24%
3180	2.19%	95.43%
2779	1.29%	96.73%



Alternative 1 (No Action) will likely perpetuate the existing level of risk for interactions between ESA-listed species and the fishery. **Alternatives 2** through **6** are unlikely to have adverse effects on listed *Acropora* species and ESA-listed marine mammals. Previous ESA consultations determined the snapper grouper fishery was not likely to adversely affect *Acropora* species. These alternatives are unlikely to alter fishing behavior in a way that would cause new adverse effects to these species.

The impacts of **Alternatives 2-6** on sea turtles and smalltooth sawfish are uncertain. If these alternatives ultimately reduce overall fishing effort, then the risk of interactions between these species and the fishery will likely be reduced. However, if these alternatives result in an effort shift and not an actual effort reduction, then the alternatives are unlikely to reduce the risk of adverse effects from interactions with the fishery.

4.2.2 Economic Effects

The analysis for this section is identical to the methodology used for black sea bass. Like the analysis used above, this analysis cannot account for the fact that a vessel may make more trips as a result of a smaller trip limit. **Table 4-40** shows revenue losses as a result of **Alternatives 2-6**. These are short-term economic effects. As expected, as trip limits decreased, and revenue losses increased. Actual losses in profits are not able to be estimated with available data. Cost data exists for the snapper grouper fishery but not for individual species like vermilion snapper. Revenue losses were highest for **Alternative 6** (400 pound trip limit) and lowest for **Alternative 3 (Preferred)** (1,500 pound trip limit). The next highest revenue losses were **Alternative 5, Sub-Alternative 4a, Alternative 4, Sub-Alternative 2a, Alternative 2, Sub-Alternative 3a,** and **Alternative 3 (Preferred)**. However, trip limits can result in a longer season which could increase ex-vessel prices and ultimately result in higher profits for some fishermen, and perhaps the fishery overall. However, this cannot be estimated at this time. This analysis simply estimates revenue losses if fishermen behavior and market prices do not change, however unrealistic that may be. As stated under the Economic Effects section under **Action 1** (Black Sea Bass), some people may choose to make additional trips to increase ex-vessel revenue. However, extra trips also increase operating costs (costs associated with food, ice, fuel, and crew). Therefore, profit increases are unlikely, especially if we assume that fishermen are maximizing profits to the extent possible under current conditions.

Table 4-40. Dockside revenues foregone as a result of Alternatives 2-6 based on 2007-2009 average landings data for vermilion snapper.

Alternative	Total revenue loss in 2009 dollars (ex-vessel revenue)
Alternative 2 (1,000 pounds gw)	$611,000
Sub-Alternative 2a (1,000 pounds gw and reduce to 500 pounds when 75% of quota is met)	$752,000
Alternative 3 (Preferred) (1,500 pounds gw)	**$306,000**
Sub-Alternative 3a (1,500 pounds gw and reduce to 500 pounds when 75% of quota is met)	$505,000
Alternative 4 (750 pounds gw)	$880,000
Sub-Alternative 4a (750 pounds gw and reduce to 500 pounds when 75% of quota is met)	$1,013,000
Alternative 5 (500 pounds gw)	$1,302,000
Alternative 6 (400 pounds gw)	$1,528,000

Table 4-41 provides dockside revenue loss estimates for five regions in the South Atlantic. These are short-term economic effects. It appears from the analysis that low vermilion trip limits

(**Alternative 6**) will impact North Carolina and Georgia and Northeast Florida the most with some effects felt in South Carolina. The remainder of the alternatives result in larger revenue losses in Georgia and Northeast Florida than in North Carolina, although the differences are relatively small.

Table 4-41. Dockside revenues foregone as a result of Alternatives 2-6 based on 2007-2009 average landings data, by state for vermilion snapper.

Alternative	North Carolina (2009 dollars)	South Carolina (2009 dollars)	Georgia and Northeast Florida (2009 dollars)	Southeast Florida (2009 dollars)	Florida Keys (2009 dollars)
Alternative 2 (1,000 pounds gw)	$232,000	$51,000	$327,000	$1,000	$0
Sub-Alternative 2a (1,000 pounds gw and reduce to 500 pounds when 75% of quota is met)	$310,000	$83,000	$389,000	$1,000	$0
Alternative 3 (Preferred) (1,500 pounds gw)	**$117,000**	**$14,000**	**$176,000**	**$0**	**$0**
Sub-Alternative 3a (1,500 pounds gw and reduce to 500 pounds when 75% of quota is met)	$223,000	$55,000	$276,000	$0	$0
Alternative 4 (750 pounds gw)	$347,000	$95,000	$437,000	$1,000	$0
Sub-Alternative 4a (750 pounds gw and reduce to 500 pounds when 75% of quota is met)	$424,000	$128,000	$488,000	$1,000	$1,000
Alternative 5 (500 pounds gw)	$544,000	$180,000	$575,000	$2,000	$1,000
Alternative 6 (400 pounds gw)	$654,000	$229,000	$641,000	$2,000	$2,000

Long term economic effects will be positive or negative depending on overall profitability of the fleet over time. As stated above, we are unable to evaluate short-term economic profitability as a result of **Alternatives 2-6** at this time and, therefore, long-term economic effects are also uncertain.

4.2.3 Social Effects

A discussion of the general direct and indirect social consequences of regulatory change is provided in **Section 4.1.3**.

Alternative 1 (No Action) would not establish a trip limit or make any other management changes for the commercial vermilion snapper component of the snapper grouper fishery. As a result, **Alternative 1 (No Action)** would not be expected to result in any change in fishing behavior, harvest patterns, or associated social benefits to fishermen or associated businesses or communities. **Alternative 1 (No Action)** would be expected to result in persistence and possible worsening of derby conditions that appear to have developed, and associated declines in social and economic benefits. As described in **Section 4.2.1**, while commercial harvest was prohibited in September 2009, the first period in which seasonal quotas were in effect, the second season quota was exceeded. Although seasonal quotas were not in effect during the 2008 fishing year, had they been in effect, fishermen would have taken the quota in September than year as well. Similar conditions appear to have developed in the first season, January through June. In 2010, the commercial quota for the January through June season was met on March 19, substantially sooner than the same amount of vermilion snapper was harvested in 2009 (June 1). Therefore, **Alternative 1 (No Action)** would be expected to result in continuation to possible acceleration of early closures for this component of the snapper grouper fishery, with associated continuation and possible increases in the reduction in social and economic benefits.

Alternatives 2-6, and sub-alternatives, would be expected to reduce the pace of vermilion snapper harvest and the length of the respective seasonal quota closures, thereby reducing the derby effects and associated reductions in social benefits. Projections of the expected season lengths under the alternative trip limits considered are provided in **Section 4.2.1**. From the narrow perspective that the longer the season, the greater the social benefits, **Alternative 6** would be expected to result in the greatest social benefits. However, the same concerns addressed in **Section 4.1.3** with respect to the proposed trip limits for black sea bass would apply here; while trip limits may extend the length of the fishing season, they 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 vermilion snapper trip limits are described in **Section 4.2.2**, noting that these estimates do not incorporate potential compensating effort or harvest behavior (more trips or altered species composition of harvests). In general, it is assumed for the purposes of this discussion that the greater the economic losses, the greater the social losses. As can be seen in **Section 4.2.2**, **Alternative 3 (Preferred)** without the step-down would be expected to result in a smaller reduction in revenues than **Sub-Alternative 3a**. Social benefits would likely be maximized as a result of some trade-off between season length and economic changes. Available data do not support a definitive numeric determination of which alternative trip limit would be expected to achieve the best social and economic results, however.

See **Section 3.7.3** for a discussion on the number of potentially affected communities and dealers with recorded vermilion snapper landings in 2008. The discussion of environmental justice considerations is provided in **Appendix D**.

4.2.4 Administrative Effects

Alternative 1 (No Action) would maintain the current cost and time associated with monitoring the vermilion snapper quotas and issuing notices upon each season's closure. Therefore, **Alternative 1 (No Action)** would have the lowest administrative impact. **Alternatives 2-6** would all increase the administrative burden because they would require enforcement of trip limits. **Sub-Alternatives 2a, 3a**, and **4a** would incur the greatest administrative impact since they would both not only require enforcement a trip limit, but also the distribution of a notice of reduced trip limits once 75% of the ACL is met.

4.2.5 Council Conclusions

Trip limit alternatives for the vermilion snapper fishery were considered as a tool to keep the commercial fishery open for a longer period of time. The Council's Snapper Grouper Advisory Panel (AP) recommended a 1,500-pound trip limit with a step-down to 500 pounds when 75% of the ACL (quota) is met or projected to be met. The step-down to 500 pounds would address the issue of regulatory discards and serve to keep the fishery open for a longer period of time. Some fishermen stated concern over a reduction in prices when the quotas are reached quickly in the absence of trip limits. They maintain that trip limits would serve to prevent market gluts and result in higher prices for their product. Some fishermen also cited an increase in the quality of the product as a reason to adopt trip limits. In addition, trip limits would deter vessels from making longer trips to fish off neighboring states.

The Socio-Economic Subpanel (SEP) of the Council's Scientific and Statistical Committee (SSC) expressed concern about the use of trip limits:
The SEP does not recommend the use of trip limits. Our primary concern with utilizing trip limits is that fishermen will increase their number of fishing trips to maintain a constant level of total revenues. The real change in the system will result from an increase in operating costs. The analysis focuses on revenue losses and we suggested that an alternative approach be used to estimate the economic impact of the trip limits. This approach would estimate average trip costs and then project those costs out as fishermen increase their trips to accommodate the trip limit restriction. We also anticipate this regulation will adversely impact the larger vessels to the advantage of the smaller vessels because the trip limit restriction is less binding for the smaller vessels. We feel this will only marginally increase the length of the season at the expense of increased physical risk and economic cost.

The Council's Law Enforcement Advisory Panel (LEAP) recommended consideration of trip limits based on numbers of fish as opposed to pounds. However, the LEAP did not express concerns over the enforceability of trip limits as they are currently proposed.

Some Council members did not favor establishing a commercial trip limit for vermilion snapper due to: 1) disproportionate impacts to larger vessels, 2) concern that displaced vessels would target inshore waters that cannot support added fishing pressure, and 3) increases in fuel prices that would impact the ability of fishermen to make more trips.

The Council ultimately chose to establish a 1,500 pounds commercial trip limit for vermilion snapper (**Preferred Alternative 3**) in response to fishermen's requests. The Council concluded the preferred alternative best meets the purpose and need to prevent the progressive shortening of the fishing season while ensuring equity in harvest opportunities, promoting safety at sea, and minimizing adverse socioeconomic impacts. The preferred alternative also best meets the objectives of the Snapper Grouper Fishery Management Plan, including preventing overfishing, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

4.3 Trip Limit for Gag

Alternative 1 (No Action). ACL (quota) is 352,940 pounds gw. Seasonal closure occurs during January-April. There is no trip limit.

Alternative 2 (Preferred). Establish a 1,000 pounds gw (1,180 pounds ww) trip limit.
> **Sub-Alternative 2a.** Establish a 1,000 pounds gw (1,180 pounds ww) trip limit and reduce to 100 pounds gw (118 pounds ww) when 75% of the commercial ACL (quota) is met or projected to be met.

Alternative 3. Establish a 750 pounds gw (885 pounds ww) trip limit.
> **Sub-Alternative 3a.** Establish a 750 pounds gw (885 pounds ww) trip limit and reduce to 100 pounds gw (118 pounds ww) when 75% of the commercial ACL (quota) is met or projected to be met.

Alternative 4. Establish a 1,000 pounds gw (1,180 pounds ww) (or the appropriate head count) trip limit with a season starting on May 1 and reduce the trip limit to 100 pounds gw when 90% of the commercial ACL (quota) is met or projected to be met.

4.3.1 Biological Effects

Alternative 1 (No Action) would retain the measures established through Amendment 16 (SAFMC 2009a), which became effective on July 19, 2009. The measures include a 352,940 pounds gutted weight (416,469 pounds whole weight) quota and a January-April spawning season closure. The quota was not met in 2009. **Table 4-42** shows the 352,940 pounds gutted weight quota would have been met in 2007. Estimated 2009 landings under the various trip limit alternatives are presented in **Table 4-43**.

Table 4-42. Landings (pounds gutted weight) of gag during May-December 2006 to 2009.

Year	ww	gw
2006	403,188	341,684
2007	490,588	415,753
2008	356,680	302,271
2009	357,428	302,905

The effect of a trip limit was determined by setting the maximum landings to an actual trip in the NMFS logbook. For example, if the trip limit was 500 pounds gutted weight, then all trips that had landings in excess of 500 pounds were changed to have landings equal to that catch level.

Although the gag landings did not exceed the quota during 2009, it is possible effort could increase during 2010 due to closures for vermilion snapper and black sea bass. **Table 4-44** shows the effect of proposed trips limits in **Alternatives 2** through **3** on gag landings during May-December 2007.

Table 4-43. Expected cumulative landings of gag during May-December 2009 for various trip limit alternatives.

Month	Alt 1	Alt 2 (Preferred) 1,000	Alt 3 750
5	34,009	34,014	33,809
6	77,680	77,065	75,542
7	110,769	108,669	105,769
8	145,796	142,881	138,537
9	184,899	181,706	176,761
10	228,237	225,043	219,836
11	264,760	261,455	255,389
12	302,905	298,270	290,734

Table 4-44. Expected cumulative landings of gag during May-December 2007 for various trip limit alternatives.

Month	Alt 1	Alt 2 (Preferred) 1,000	Alt 3 750	Alt 2a 1,000 to 100	Alt 3a 750 to 100	Alt 4 1,000 to 100
5	74,653	64,330	57,889	64,330	57,889	64,330
6	159,990	140,646	128,546	140,646	128,546	140,646
7	210,544	187,406	172,614	187,406	172,614	187,406
8	253,901	229,898	212,997	229,898	212,997	229,898
9	280,097	255,809	238,532	255,809	238,532	255,809
10	311,799	284,241	265,336	276,053	264,489	284,241
11	352,959	322,566	302,097	292,843	281,279	307,491
12	415,753	380,706	356,598	315,043	303,479	329,691
Date quota met	30-Nov	14-Dec	31-Dec			
Date 75% met	17-Sep	15-Oct	29-Oct			
Date 90% met		9-Nov				

If future landings were similar to those in 2007, a 1,000 pounds gutted weight pound trip limit (**Alternative 2 (Preferred)**) would not keep the season open all year (**Table 4-44**). However, if the 1,000 pounds gutted weight trip limit was reduced to 100 pounds gutted weight (**Sub-Alternative 2a**) when 75% of the quota was met, the quota would come within 30,000 pounds of being met. Under **Alternative 3** (750 pounds gutted weight), the gag fishery would be expected to remain open until the end of December. The quota would not be met under the remaining alternatives. A 15% reduction in gag harvest during May-December 2007 (352,940/415,753) is required to keep the fishery open all season. **Table 4-45** also shows the required trip limit to keep the 2007 trip limit open all year would be between 678 and 763 pounds gutted weight. The biological effects of the alternatives would be least for **Alternative 1 (No Action)** and greatest for **Sub-Alternative 3a**, which would allow for the least amount of harvest.

Alternative 4 would establish a 1,000 pounds gutted weight trip limit that would be reduced to 100 pounds gutted weight when 90% of the quota is expected to be met. Based on 2007 conditions, the 90% of the quota would be met in November. The quota would be met soon after the trip limit was reduced to 100 pounds gutted weight; therefore, it could be very difficult to monitor landings for the remaining 10% of the quota and there is a greater chance the quota could be exceeded.

The dates specified in **Table 4-44** do not consider some trips would be shortened by the trip limit and fishermen might increase the number of trips to compensate for a lower trip limit. It might be expected that decrease in the trip limit, there might be an increase in the number of trips. However, fuel costs and distance traveled to fishing grounds would also be a factor in whether or not a fishermen would increase the number of trips. With small trip limits, the cost of fuel moving to and from the fishing grounds could limit profit to the extent that the trip would not be taken. **Table 4-44** provides some indication of the percentage of trips greater than the proposed trip limits. For example, less than 4% of the trips in **Table 4-45** for gag were greater than 1,000 pounds gutted weight; therefore, a small increase in the trips would be expected if this trip limit were established. Furthermore, less than 10% of the trips had catches greater than 500 pounds gutted weight so a greater number of increased trips would be expected but it would not be substantial.

Table 4-45. Number of trips, % trips, pounds over trips and % reduction in harvest for trip limit for gag.

Trip Limit	May-December 2007				May-December 2009			
	# Trips	% Trips	Pounds over trip	% Reduct	# Trips	% Trips	Pounds over trip	% Reduct
0	2,078	100.00%	415,753	100.00%	1,897	100.00%	302,905	100.00%
85	1,111	53.46%	286,903	69.01%	964	50.82%	187,561	61.92%
97	1,025	49.33%	273,400	65.76%	885	46.65%	175,763	58.03%
127	831	39.99%	246,021	59.17%	740	39.01%	151,706	50.08%
148	734	35.32%	229,459	55.19%	658	34.69%	136,995	45.23%
169	651	31.33%	214,804	51.67%	594	31.31%	123,743	40.85%
212	531	25.55%	189,801	45.65%	468	24.67%	101,261	33.43%
254	437	21.03%	169,449	40.76%	367	19.35%	83,705	27.63%
424	234	11.26%	115,080	27.68%	164	8.65%	41,907	13.84%
508	193	9.29%	96,734	23.27%	115	6.06%	30,376	10.03%
593	170	8.18%	81,263	19.55%	84	4.43%	22,172	7.32%
678	138	6.64%	68,308	16.43%	64	3.37%	16,071	5.31%
763	114	5.49%	57,704	13.88%	45	2.37%	11,618	3.84%
847	98	4.72%	48,693	11.71%	33	1.74%	8,456	2.79%
932	88	4.23%	40,803	9.81%	23	1.21%	5,970	1.97%
1,017	83	3.99%	33,662	8.10%	16	0.84%	4,379	1.45%
1,102	74	3.56%	27,089	6.52%	11	0.58%	3,209	1.06%
1,186	62	2.98%	21,366	5.14%	9	0.47%	2,373	0.78%
1,271	50	2.41%	16,610	4.00%	5	0.26%	1,784	0.59%
1,356	41	1.97%	12,815	3.08%	3	0.16%	1,462	0.48%
1,441	32	1.54%	9,825	2.36%	3	0.16%	1,208	0.40%
1,525	25	1.20%	7,515	1.81%	2	0.11%	992	0.33%
1,610	22	1.06%	5,519	1.33%	2	0.11%	823	0.27%
1,695	12	0.58%	3,996	0.96%	2	0.11%	653	0.22%
1,907	9	0.43%	2,004	0.48%	1	0.05%	326	0.11%
2,119	3	0.14%	706	0.17%	1	0.05%	114	0.04%
2,331	2	0.10%	191	0.05%	0	0.00%	0	0.00%
2,542	0	0.00%	0	0.00%	0	0.00%	0	0.00%
2,754	0	0.00%	0	0.00%	0	0.00%	0	0.00%
2,966	0	0.00%	0	0.00%	0	0.00%	0	0.00%
3,178	0	0.00%	0	0.00%	0	0.00%	0	0.00%
3,390	0	0.00%	0	0.00%	0	0.00%	0	0.00%
3,602	0	0.00%	0	0.00%	0	0.00%	0	0.00%
3,814	0	0.00%	0	0.00%	0	0.00%	0	0.00%
4,025	0	0.00%	0	0.00%	0	0.00%	0	0.00%

Alternative 1 (No Action) will likely perpetuate the existing level of risk for interactions between ESA-listed species and the fishery. **Alternatives 2 (Preferred)** and **3** and their sub-alternatives are unlikely to have adverse effects on listed *Acropora* species and ESA-listed marine mammals. Previous ESA consultations determined the snapper grouper fishery was not likely to adversely affect *Acropora* species. These alternatives are unlikely to alter fishing behavior in a way that would cause new adverse effects to these species.

The impacts of **Alternatives 2 (Preferred), 3** and **4,** and their sub-alternatives on sea turtles and smalltooth sawfish are uncertain. If these alternatives ultimately reduce overall fishing effort, then the risk of interactions between these species and the fishery will likely be reduced. However, if these alternatives result in an effort shift and not an actual effort reduction, then the alternatives are unlikely to reduce the risk of adverse effects from interactions with the fishery.

4.3.2 Economic Effects

Table 4-46 shows revenue losses as a result of **Alternatives 2 (Preferred)-4** using the same methodology as was used for black sea bass and vermilion, except in the case of **Sub-Alternatives 2a and 3a** where biological pounds not caught were used and multiplied by ex-vessel prices for 2007 and 2009 (see footnote) and **Alternative 4** which is qualitatively analyzed due to lack of analysis starting on May 1. The results indicate that lower trip limits result in greater losses in ex-vessel revenues with **Sub-Alternative 3a** having the greatest negative short-term economic effects followed by **Sub-Alternative 2a**, **Alternative 4**, **Alternative 3**, and **Alternative 2 (Preferred)** based on landings made in previous years. As stated previously, the methodologies used do not account for fishermen increasing the number of trips they take in reaction to implementation of a trip limit. Actual changes in profits cannot be estimated at this time due to a lack of cost data for particular species. Cost data only exists for the entire snapper grouper fishery but not for harvest of individual species. Therefore, it is not known which of the alternatives ultimately results in a more economically preferable outcome since lower trip limits could result in higher ex-vessel prices. However, unless this occurs, trip limits will likely result in lower aggregate profitability for the fishery since it will result in more trips being taken which increases operating costs (costs associated with food, ice, fuel and crew) without increasing total landings.

Table 4-46. Dockside revenues foregone as a result of Alternatives 2-4 based on 2007-2009 average landings data for gag.

Alternatives	Total revenue loss in 2009 dollars (ex-vessel revenue)
Alternative 2 (Preferred) (1,000 pounds gw)	**$102,000**
Sub-Alternative 2a (1,000 pounds gw and reduce to 100 pounds when 75% of quota is met)*	$392,000 (2007 landings); $204,000 (2009 landings)
Alternative 3 (750 pounds gw)	$194,000
Sub-Alternative 3a (750 pounds gw and reduce to 100 pounds when 75% of quota is met)	$467,000 (2007 landings); $228,000 (2009 landings)
Alternative 4 (1000 pounds gw with season starting May 1 and reduce to 100 pounds when 90% of quota is met)	Less than Sub-Alternative 2a but greater than Alternative 2

* Sub-Alternatives 2a and 3a cannot be analyzed using the methodology employed for Alternatives 2 and 3. Instead, biological results for similar trip limits were used to make economic estimates with weighted averages of landings multiplied by ex-vessel prices received during 2007 and 2009.

Table 4-47 shows revenue losses for **Alternatives 2 (Preferred)-4** by state for gag grouper. South Carolina and Georgia and Northeast Florida are most negatively economically affected by trip limits. While **Alternative 2 (Preferred)** has an equal impact on South Carolina and Georgia and Northeast Florida, **Sub-Alternatives 2a** and **3a** have a greater negative effect on South Carolina since the average gag pounds per trip harvested in South Carolina are greater than the average gag pounds harvested per trip in Georgia and Northeast Florida. Economic effects of **Alternative 4** fall in between **Alternative 2 (Preferred)** and **Sub-Alternative 2a**. An actual revenue loss value cannot be estimated given the change in the fishing year start date.

Table 4-47. Dockside revenues foregone as a result of Alternatives 2-4 based on 2007-2009 average landings data for gag, by state, for gag.
Values are in 2009 dollars.

Alternatives	North Carolina	South Carolina	Georgia Northeast Florida	Southeast Florida	Florida Keys
Alternative 2 (Preferred) (1,000 pounds gw)	**$1,000**	**$48,000**	**$48,000**	**$5,000**	**$0**
Sub-Alternative 2a (1,000 pounds gw and reduce to 100 pounds when 75% of quota is met)	$10,000 (2007 season), $5,000 (2009 season)	$203,000 (2007 season), $105,000 (2009 season)	$157,000 (2007 season), $82,000 (2009 season)	$21,000 (2007 season, $11,000 (2009 season)	$0 (2007 season, $0 (2009 season)
Alternative 3 (750 pounds gw)	$5,000	$100,000	$78,000	$11,000	$0
Sub-Alternative 3a (750 pounds gw and reduce to 100 pounds when 75% of quota is met)	$12,000 (2007 season), $6,000 (2009 season)	$242,000 (2007 season), $118,000 (2009 season)	$187,000 (2007 season), $91,000 (2009 season)	$26,000 (2007 season, $12,000 (2009 season)	$0 (2007 season, $0 (2009 season)
Alternative 4 (1000 pounds gw with season starting May 1 and reduce to 100 pounds when 90% of quota is met)	Less than Alternative 2a but greater than Alternative 2	Less than Alternative 2a but greater than Alternative 2	Less than Alternative 2a but greater than Alternative 2	Less than Alternative 2a but greater than Alternative 2	Less than Alternative 2a but greater than Alternative 2

Long-term economic effects will be positive or negative depending on overall profitability of the fleet over time. As stated above, we are unable to evaluate the short-term economic profitability of **Alternatives 2 (Preferred)-4** at this time and therefore the long-term economic effects are also uncertain.

4.3.3 Social Effects

A discussion of the general direct and indirect social consequences of regulatory change is provided in **Section 4.1.3**.

Alternative 1 (No Action) would not establish a trip limit or make any other management changes for the commercial gag component of the snapper grouper fishery. As a result, **Alternative 1 (No Action)** would not be expected to result in any change in fishing behavior, harvest patterns, or associated social benefits to fishermen or associated businesses or communities. **Alternative 1 (No Action)** may or may not be expected to result in any adverse social conditions because it is unknown whether effort and harvests conditions in the future will be more like those of 2009 or those of 2007. As described in **Section 4.3.1**, the commercial gag harvest in 2009 did not exceed the quota, so no closure was required. However, if harvest conditions are similar to those that occurred in 2007, the gag quota would be expected to be met in November. Closures for other snapper grouper species could precipitate a return to 2007 gag harvest conditions, as well as an even faster harvest pace, resulting in a substantial closure under **Alternative 1 (No Action)**, with associated reductions in social benefits. This quota closure would occur in addition to the current seasonal harvest prohibition during January through April. Therefore, **Alternative 1 (No Action)** could be expected to result in either no change is social benefits if 2009 harvest conditions persist or substantial reductions in social benefits if accelerated harvest conditions develop, resulting in derby conditions and lengthy harvest prohibitions.

Alternative 2 (Preferred), Alternative 3 (and sub-alternative), and **Alternative 4** would be expected to reduce the pace of gag harvest and the length of any potential quota closures, thereby reducing the derby effects and associated reductions in social benefits. Projections of the expected season lengths under the alternative trip limits considered are provided in **Section 4.3.1**. From the narrow perspective that the longer the season, the greater the social benefits, **Alternative 3** would be expected to result in the greatest social benefits. It is noted, however, that social and economic benefits are expected to be increased the greater the portion of quota that is actually harvested (the discussion on the expected effects of leaving quota unharvested provided in **Section 4.1.3** applies for gag also). While both **Sub-Alternatives 2a** and **3a** would be expected to allow commercial harvest to continue the whole year, neither would be expected to allow the harvest of the complete quota. As a result, each would be expected to result in reduced social and economic benefits relative to **Alternative 2 (Preferred)** and **Alternative 3**. The effects of **Alternative 4** would likely be intermediate between those of **Alternative 2 (Preferred)** and **Sub-Alternative 2a**.

However, the same concerns addressed in **Section 4.1.3** with respect to the proposed trip limits for black sea bass and **Section 4.2.3** with respect to vermilion snapper would apply here; while trip limits may extend the length of the fishing season, they 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 gag trip limits are described in **Section 4.3.2**, noting that these estimates do not incorporate potential compensating effort or harvest behavior (more trips or altered species composition of harvests). 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. Available data does not support a definitive numeric determination of which alternative trip limit would be expected to achieve the best social and economic results, however.

See **Section 3.7.3** for discussion on the number of potentially affected communities and dealers with recorded gag landings in 2008. The discussion of environmental justice considerations is provided in **Appendix D**.

4.3.4 Administrative Effects

Alternative 1 (No Action) would maintain the current cost and time associated with monitoring the gag quota and issuing notices upon each season's closure. Therefore, **Alternative 1 (No Action)** would have the lowest administrative impact. **Alternatives 2 (Preferred)** and **3** would all increase the administrative burden because they would require enforcement of trip limits. **Sub-Alternatives 2a** and **3a** would incur the greatest administrative impact since they would both not only require enforcement of a trip limit, but also the issuance of a notice of reduced trip limits once 75% of the quota is met. The administrative impacts of **Alternative 4** would be similar those under **Sub-Alternatives 2a** and **3a** because it would also require in-season tracking to determine when 90% of the ACL is projected to caught. However, the administrative impacts of **Alternative 4** could be greater than the other alternatives because the quota would be met soon after the trip limit was reduced to 100 pounds gutted weight. Therefore, it could be very difficult to monitor landings for the remaining 10% of the quota and there is a greater chance the quota could be exceeded. If the in-season monitoring does not allow for enough time to close the fishery before exceeding the ACL (quota), corrective post-season accountability measures would be required.

4.3.5 Council Conclusions

Trip limit alternatives for the gag fishery were considered as a tool to keep the commercial fishery open for a longer period of time. The Council's Snapper Grouper Advisory Panel (AP) recommended that the Council adopt a 1,000-pound trip limit for gag. The AP stated that trips for gag rarely go over 1,000 pounds. In addition, the AP recommended changing the start of the fishing year to May 1st and reducing the trip limit to 100 pounds when 90% of the quota is met or projected to be met. Some members of the AP were in favor of the Council considering trip limit alternatives based on numbers of fish rather than pounds.

The Socio-Economic Subpanel (SEP) of the Council's Scientific and Statistical Committee (SSC) expressed concern over the use of trip limits:
The SEP does not recommend the use of trip limits. Our primary concern with utilizing trip limits is that fishermen will increase their number of fishing trips to maintain a constant level of total revenues. The real change in the system will result from an increase in operating costs. The analysis focuses on revenue losses and we suggested that an alternative approach be used to

estimate the economic impact of the trip limits. This approach would estimate average trip costs and then project those costs out as fishermen increase their trips to accommodate the trip limit restriction. We also anticipate this regulation will adversely impact the larger vessels to the advantage of the smaller vessels because the trip limit restriction is less binding for the smaller vessels. We feel this will only marginally increase the length of the season at the expense of increased physical risk and economic cost.

The Council's Law Enforcement Advisory Panel (LEAP) recommended consideration of trip limits based on numbers of fish as opposed to pounds. However, the LEAP did not express concerns over the enforceability of trip limits s they are currently proposed.

The Council chose as their preferred alternative to set the commercial trip limit for gag at 1,000 pounds based on fishermen's input (**Preferred Alternative 2**). However, the recommendation to step-down to 100 pounds when 90% of the ACL (quota) is met or projected to be met was not selected due to the inability of current NMFS SEFSC quota tracking systems to track landings in as timely a manner as would be required. The Council concluded the preferred alternative best meets the purpose and need to prevent the progressive shortening of the fishing season while ensuring equity in harvest opportunities, promoting safety at sea, and minimizing adverse socioeconomic impacts. The preferred alternative also best meets the objectives of the Snapper Grouper Fishery Management Plan, including preventing overfishing, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

4.4 Trip Limit for Greater Amberjack

Alternative 1 (No Action). Retain the current commercial regulations for greater amberjack in the South Atlantic (**Table 4-48**).

Table 4-48. Current Commercial Regulations for Greater Amberjack

Commercial ACL	Size Limit	Trip Limit	Fishing Season	Other
1,169,931 pounds gw	36" FL	1,000 pounds gw	Closed April 1-30	No sale in April; purchase and sale prohibited once quota is reached. After quota is met, possession limited to 1/person/day or 1/person/trip, whichever is more restrictive

Alternative 2. Change the commercial trip limit for greater amberjack.

Sub-Alternative 2a. Increase the greater amberjack commercial trip limit to 2,000 pounds gutted weight.

Sub-Alternative 2b. Increase the greater amberjack commercial trip limit to 1,500 pounds gutted weight.

Sub-Alternative 2c (Preferred). Increase the greater amberjack commercial trip limit to 1,200 pounds gutted weight.

4.4.1 Biological Effects

Alternative 1 (No Action) would retain the commercial regulations in place for greater amberjack including a 36" fork length minimum size limit, a 1,000 pounds gutted weight trip limit, a April 1-30 prohibition on harvest, and a 1,169,931 pounds gutted weight quota. SEDAR 15 (2008) indicates the stock is not experiencing overfishing (F_{2006}/F_{MSY} = 0.531) and is not overfished (SSB_{2006}/SSB_{MSY} = 1.096). Furthermore, the commercial quota has never been met since it was established through Amendment 9 in 1999 (SAFMC 1998a; **Table 4-49**). With increased restrictions on other snapper grouper species through Amendments 13C and 16, there has been an interest in increasing the trip limit for greater amberjack.

Table 4-49. Annual commercial landings (whole weight and gutted weight) of greater amberjack during 1986 to 2009.
Data provided by the Southeast Fisheries Science Center.

Year	whole weight	gutted weight
1986	414,590	398,644
1987	1,295,813	1,245,974
1988	1,181,594	1,136,148

Table 4-49. Continued. Annual commercial landings (whole weight and gutted weight) of greater amberjack during 1986 to 2009.

Year	whole weight	gutted weight
1989	1,107,288	1,064,700
1990	1,678,728	1,614,162
1991	1,990,243	1,913,695
1992	1,951,386	1,876,333
1993	1,503,252	1,445,435
1994	1,583,182	1,522,290
1995	1,549,312	1,489,723
1996	1,219,049	1,172,163
1997	1,023,967	984,584
1998	954,111	917,414
1999	813,012	781,742
2000	655,229	630,028
2001	670,671	644,876
2002	675,164	649,196
2003	604,753	581,493
2004	813,589	782,297
2005	783,399	753,268
2006	472,619	454,441
2007	508,940	489,365
2008	655,818	630,594

Alternative 2 would increase the trip limit for greater amberjack from 1,000 pounds gutted weight to 2,000 pounds gutted weight under **Sub-Alternative 2a** and 1,500 pounds gutted weight under **Sub-Alternative 2b**. During the 2008 fishing year (May 2008-April 2009) the estimated landings of greater amberjack from logbook data were 730,854 pounds gutted weight. In order to estimate what the landings would be with an increased trip limit it was assumed that all fishermen who reached the 1,000 pounds gutted weight trip limit would achieve the new trip limit. Further, it was assumed that the same amount of overage of the 1,000 pounds gutted weight trip limit would occur with a higher trip limit. It was also assumed that trips, which did not achieve the 1,000 pounds gutted weight trip limit, would not reach a higher trip limit.

Based on data from the 2008 fishing year, the commercial quota of 1,169,931 pounds gutted weight quota would not be reached with either the 2,000 pounds trip limit proposed under **Sub-Alternative 2a**, the 1,500 pounds trip limit proposed under **Sub-Alternative 2b**, or the 1,200 pounds trip limit proposed under **Sub-Alternative 2c (Preferred)** (**Table 4-50**). Effort could increase on greater amberjack due to restrictions proposed in Amendments 17A (SAFMC 2010a) and 17B (SAFMC 2010b). This could result in the quota being met before the fishing year is completed. Since SEDAR 15 (2008) indicates release mortality rate of greater amberjack is low (20%), high mortality of greater amberjack after a quota was met would not be likely.

Table 4-50. Estimated landings of greater amberjack expected from increased trip limit. Based on data from May 2008-April 2009 from NMFS Logbook.

Trip Limit (gutted weight)	Whole Weight	Gutted Weight
Alternative 1 - 1,000 pounds	760,089	730,855
Sub-Alternative 2a - 2,000 pounds	929,961	894,194
Sub-Alternative 2b - 1,500 pounds	839,510	807,222
Sub-Alternative 2c (Preferred) - 1,200 pounds	**793,577**	**763,054**

Among the proposed alternatives, **Alternative 1 (No Action)** would have the greatest positive biological effect since it would not result in an increased harvest of greater amberjack. **Sub-Alternative 2a**, which would allow for the largest increase in the trip limit would have the greatest negative biological effect on the species. However, the recent assessment indicates the stock is not overfished and is not experiencing overfishing. Based on data from the 2008 fishing year, increasing the trip limit to 2,000 pounds gutted weight in **Sub-Alternative 2a** would result in landings that are approximately 276,000 pounds less than the quota. Furthermore, incidental mortality of greater amberjack would be expected to be low if the quota was met due to low a low release mortality rate. The biological effect of **Preferred Sub-Alternative 2c** and **Sub-Alternative 2b** would be intermediate between **Alternative 1 (No Action)** and **Sub-Alternative 2a**. Therefore, none of the alternatives are expected to have negative biological effects on the stock of greater amberjack.

Alternative 1 (No Action) will likely perpetuate the existing level of risk for interactions between ESA-listed species and the fishery. **Alternatives 2** and its sub alternatives are unlikely to have adverse effects on listed *Acropora* species and ESA-listed marine mammals. Previous ESA consultations determined the snapper grouper fishery was not likely to adversely affect *Acropora* species. These alternatives are unlikely to alter fishing behavior in a way that would cause new adverse effects to these species.

The impacts to sea turtles and smalltooth sawfish from **Alternatives 2** and its sub alternatives are uncertain. If these alternatives ultimately reduce overall fishing effort, then the risk of interactions between these species and the fishery will likely be reduced. However, if these alternatives result in an effort shift and not an actual effort reduction, then the alternatives are unlikely to reduce the risk of adverse effects from interactions with the fishery.

4.4.2 Economic Effects

Because the greater amberjack alternatives propose an increase in trip limits, there are no ex-vessel revenue losses expected as a result of these alternatives. In general, larger trip limits should be beneficial to commercial fishermen unless the quota is filled more quickly and the season becomes shorter. The key is the effect of larger trip limits on the length of the fishing season. We cannot determine with current logbook data how the frequency distribution of pounds per trip would change with larger trip limits, and hence do not know if larger trip limits are likely to result in shorter seasons. **Sub-Alternatives 2a-2c** are expected to result in short-term economic benefits unless the season is shortened. Actually increases in aggregate profits to the fishery are not able to be estimated because cost data is only available for the snapper grouper fishery as a whole and not for individual species.

4.4.3 Social Effects

A discussion of the general direct and indirect social consequences of regulatory change is provided in **Section 4.1.3**.

Alternative 1 (No Action) would not establish a new trip limit or make any other management changes for the commercial greater amberjack component of the snapper grouper fishery. As a result, **Alternative 1 (No Action)** would not be expected to result in any change in fishing behavior, harvest patterns, or associated social benefits to fishermen or associated businesses or communities. Although **Alternative 1 (No Action)** would not result in any management changes, it would be expected to continue the situation of reduced social and economic benefits to fishermen and associated businesses and communities associated with an apparent inability to harvest the commercial quota. As described in **Section 4.4.1**, the commercial greater amberjack component of the snapper grouper fishery is regulated under a 1,000-pounds trip limit and the commercial quota has never been harvested since the quota was established in 1999. If the quota underage is a result of demand conditions, i.e., fishermen are harvesting and markets are receiving as much greater amberjack as they want on both a trip and total basis, then social benefits associated with harvest limits (other restrictions unrelated to the quota or trip limit may also affect the social benefits, so alleviating trip limit or quota restrictions may not result in total maximum social benefits) will be maximized by maintaining current regulations. However, if current quota underages are a result of regulatory restriction, relaxing appropriate restrictions would be expected to result in increased social benefits. Similar to the discussion in **Section 4.1.3** on black sea bass, not harvesting the full quota may have some stock benefits. However, the specification of the quota incorporates considerations of stock conditions and needs, and the social and economic benefits of such, and represents the allowable harvest expected to maximize these benefits given said stock conditions. Therefore, continued quota underages, as would be expected under **Alternative 1 (No Action),** would be expected to result in continued losses of social benefits.

Alternative 2 (with sub-alternatives) would be expected to result in increased social and economic benefits by increasing the opportunity to harvest the full quota. Projections of the expected season lengths under the alternative trip limits considered are provided in **Section 4.4.1**. While all of the alternatives considered would be expected to result in increased harvests, and associated social and economic benefits, relative to **Alternative 1 (No Action)**, absent fishing behavioral changes, e.g., more trips harvesting greater amberjack, none of **Sub-Alternatives 2a-2c** would be expected to result in full harvest of the commercial quota. Nevertheless, from the perspective that social benefits would be expected to increase directly with increased harvest (subject to the limits of the quota), **Sub-Alternative 2a** would be expected to result in the largest total harvests and, therefore, the greatest social benefits, followed by **Sub-Alternative 2b** and **Sub-Alternative 2c (Preferred)**. It is noted, however, that the expected disparity between the projected harvests and the quota may, despite the expectation that harvests and benefits would increase, still result in some adverse social reaction if the perception is that the trip limits are still not liberal enough (even **Sub-Alternative 2a** would be expected to result in almost 300,000 pounds of quota left unharvested). If greater amberjack target effort increases in response to increased restrictions on other species, the moderate increase in the trip limit that would occur under **Sub-Alternative 2c (Preferred)** may result in a better social and economic outcome than the other alternatives by allowing the increased benefits associated with the increase in the trip limit while avoiding potential problems associated with rapid increases in participation that could be attracted by higher trip limits, and lower prices that could result from increased harvest flow through markets.

See **Section 3.7.3** for discussion on the number of potentially affected communities and dealers with recorded greater amberjack landings in 2008. The discussion of environmental justice considerations is provided in **Appendix D**.

4.4.4 Administrative Effects

Because there is already a trip limit in place, simply increasing the trip limit would not result in any administrative impacts over the status quo. However, if a shift in effort into the greater amberjack fishery combined with an increased trip limit leads to a quota closure or some other form of corrective action, some administrative work may be required in the form of distributing a closure notice or other types of constituent outreach efforts.

4.4.5 Council Conclusions

Currently, there is a 1,000-pound gutted weight commercial trip limit for greater amberjack, which is effective each year until the quota is reached. However, since the trip limit was implemented, the commercial quota for greater amberjack has never been reached. An increase in the trip limit was considered to give fishermen the opportunity to harvest the entire commercial ACL (quota) and to mitigate for increased restrictions in other fisheries. The Council's Snapper Grouper Advisory Panel (AP) recommended that the Council take no action. Similarly, the majority of public comments revealed support for maintaining the current regulations.

The Socio-Economic Subpanel (SEP) of the Council's Scientific and Statistical Committee (SSC) expressed concern over the use of trip limits:
The SEP does not recommend the use of trip limits. Our primary concern with utilizing trip limits is that fishermen will increase their number of fishing trips to maintain a constant level of total revenues. The real change in the system will result from an increase in operating costs. The analysis focuses on revenue losses and we suggested that an alternative approach be used to estimate the economic impact of the trip limits. This approach would estimate average trip costs and then project those costs out as fishermen increase their trips to accommodate the trip limit restriction. We also anticipate this regulation will adversely impact the larger vessels to the advantage of the smaller vessels because the trip limit restriction is less binding for the smaller

vessels. We feel this will only marginally increase the length of the season at the expense of increased physical risk and economic cost.

The Council's Law Enforcement Advisory Panel (LEAP) recommended consideration of trip limits based on numbers of fish as opposed to pounds. However, the LEAP did not express concerns over the enforceability of trip limits s they are currently proposed.

Some members of the Council supported maintaining the current 1,000-pound commercial trip limit. They maintained that the quota has never been met and the fishery cannot withstand day trips of over 1,000 pounds. There was concern that even though there is evidence that the fishery is improving, increasing harvest at this time would be too soon. The Council had originally selected as their preferred alternative a commercial trip limit of 1,500 pounds. However, after receiving public testimony, particularly from fishermen in the Florida Keys, and engaging in further discussion, the Council chose to take a more precautionary approach and increase the trip limit to 1,200 pounds (**Preferred Sub-Alternative 2c**)

The Council concluded the preferred alternative best meets the purpose and need to prevent the progressive shortening of the fishing season while ensuring equity in harvest opportunities, promoting safety at sea, and minimizing adverse socioeconomic impacts. The preferred alternative also best meets the objectives of the Snapper Grouper Fishery Management Plan, including preventing overfishing, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

4.5 Business Activity Effects

4.5.1 Commercial Sector

This section provides estimates of the business activity associated with the potential changes in commercial ex-vessel revenues that may occur as a result of the proposed management changes. Business activity is characterized in the form of FTE jobs, income impacts (wages, salaries, and self-employed income), and output (sales) impacts (gross business sales). Income impacts should not be added to output (sales) impacts because this would result in double counting. Job and output (sales) impacts, however, may be added across commercial and recreational sectors.

These estimates of business activity are provided to inform the decision process of the potential consequences of the proposed management changes. However, it should be emphasized that these estimates should not be confused with the estimated changes in economic value provided above as business activity and economic value are not equivalent concepts.

While business activity and economic value are not equivalent concepts, the calculation of the change in business activity utilizes variables that were used in the calculation of the expected change in economic value, specifically ex-vessel revenues in the commercial sector. Because both assessments (change in economic value and change in business activity) use this common variable, the ranking of alternatives based on the magnitude of these effects is unaffected by the metric examined; the greater the estimated change in economic value, the greater the estimated change in business activity.

The estimates of the change in business activity should be interpreted and used with caution. While some change (loss or gain) of business activity would be expected to result from any change in commercial revenues, the full loss or gain of the estimates provided below should not be expected to occur as a result of the proposed management changes. The primary reason for this is the calculation of these results does not account for behavioral changes that would be expected to occur in response to the proposed management changes. In the commercial sector, an estimated loss in ex-vessel revenues may be overstated if fishermen are able to re-direct their fishing effort to substitute species, while an estimated gain in ex-vessel revenues may come at the expense of reduced harvests of, and revenues from, other species.

In the commercial sector, fishing revenues generate business activity in multiple sectors of the economy. These sectors are combined and summarized in the business activity model as harvester, dealer/processor, wholesaler/distributor, grocer, and restaurant sectors. In the event of a projected reduction of fishing revenues, while the loss of jobs and business activity in the harvester and dealer/processor sectors may be likely due to potentially limited substitution opportunities, losses in other sectors are less likely. Although not shown in the tables below, the business activity associated with commercial seafood ex-vessel revenues is dominated by activity in the restaurant sector. For example, $1 million in commercial reef fish (snapper grouper) ex-vessel revenues in Florida is estimated to support 79 total FTE jobs, of which 52 are estimated to occur in the restaurant sector. Given dining substitution alternatives, which include both imported and domestic seafood, as well as non-seafood fare, there should be little expectation that the reduction in the supply of a single species or even multiple species of seafood would result in the loss of either the full amount or a substantial portion of the associated business activity in the restaurant sector (exceptions may occur for specialty or niche markets). The same logic applies to activity in the grocers sector and, to lesser degrees, for secondary wholesalers/distributors and primary dealers/processors. Each sector would be expected to attempt to locate and promote the sales of similar products from alternative sources or other products when similar products are unavailable. Even if diners chose to eat out less, a portion of the food/nutritional component of their affected restaurant expenditures probably would be re-directed to grocery expenditures, while a portion of the recreational/entertainment component of their affected restaurant expenditures probably would be re-directed towards other recreational activities. Any remaining portion of their affected restaurant expenditures probably would be re-directed to other budget expenses. As a result, while the resulting business activity associated with these behavioral changes would no longer be associated with the domestic fishery for the regulated species, alteration of spending patterns may result in transfer of business activity to other sectors rather than loss of business activity.

If harvests and ex-vessel revenues increase as a result of management, then improved employment conditions through greater job stability and improved incomes for current workers may occur instead of increased employment in the harvester and dealer/processor sectors. In the grocer and restaurant sectors, increased purchases of the subject species may occur at the expense of other products. In this event, these increased purchases would represent transferred business activity and not new business activity.

In summary, the following results capture neither the behavioral possibilities within the fishing industry nor the substitution possibilities in associated sectors. Some loss of business activity in the fishing industry is unavoidable in response to reduced commercial ex-vessel revenues and recreational trips. However, loss of the total business activity associated with these revenues or angler trips should not be expected. Similarly, some gain in business activity will likely occur in the event of increased commercial revenues. However, gain of the total potential business activity associated with these revenues should not be expected.

It should be noted that the estimated changes in business activity for Georgia-NE Florida may underestimate actual effects. The model used for this analysis is organized by state, whereas the estimated changes in ex-vessel revenues must combine Georgia with portions of Florida for confidentiality considerations. Fish revenues flow through each state's economy differently. As an example, repeating the example discussed above, while $1 million in reef fish (snapper grouper) ex-vessel revenues is estimated to support 79 FTE jobs in Florida (18 in the harvester sector), $1 million in reef fish (snapper grouper) ex-vessel revenues is estimated to support 173 FTE jobs in Georgia (61 in the harvester sector). Total output (sales) impacts associated with these revenues is approximately $4 million (2008 dollars) for Florida and $7.7 million for Georgia. As a result, based on current model estimates, each dollar in ex-vessel reef fish (snapper grouper) revenues is estimated to support more business activity in Georgia than in Florida. The estimated potential change in business activity for Georgia-NE Florida in this analysis is calculated using the Florida model. Because the Georgia portion of ex-vessel revenues in the combined Georgia-NE Florida total are subjected to the lower Florida model parameters instead of the higher Georgia parameters, the estimated change in business activity for the combined area will be lower than actual change.

Estimates of the expected change in business activity with respect to **Alternative 1 (No Action)** for select alternatives for the proposed black sea bass, vermilion snapper, and gag actions are provided in **Tables 4-51 to 4-56**. Estimates are provided for the entire U.S. (**Table 4-51**), and by state/region (North Carolina, South Carolina, Georgia-northeast Florida (south through Volusia County), central-south Florida (through Dade County), and the Florida Keys (Monroe County); **Tables 4-52 to 4-56**. All dollar values are in 2008 dollars in order to be consistent with the business activity model. As a result, the estimates of expected change in ex-vessel (dockside) revenues are slightly different than provided in previous tables depicting expected changes in dockside revenues, which are in 2009 dollars.

Analysis of the expected change in business activity associated with the proposed changes in the greater amberjack commercial trip limit are not provided because estimates of the expected change in ex-vessel revenues associated with the proposed trip limits cannot be estimated with any reasonable degree of certainty with available data. In general, based on average annual harvests (approximately 690,725 pounds; see **Table 3-11**) and the commercial ACL (1,169,931 million pounds; see **Table 2-4**), it is possible for commercial greater amberjack harvests and revenues (assuming no price effects) to increase by 41%, with associated increases in business activity (see **Table 3-13** for estimates of the average annual economic activity associated with greater amberjack harvests). It is logical that the higher the trip limit, the more likely that more of the ACL will be harvested, resulting in increased revenues and business activity. However, uncertainties associated with fishermen behavior and market demand preclude the provision of reliable estimates of revenue, and associated business activity, increases. While it might be assumed, for analytical purposes, that all trips that typically harvest greater amberjack would harvest the new limit under each of the proposed alternative trip limits, this would likely be an unlikely outcome producing an unrealistic upper limit of economic impacts serving no purpose other than providing an upper limit. As a result, no analytic estimation of the expected change in ex-vessel revenues and associated business activity is attempted, and this analysis simply concludes that increases in business activity may occur as the trip limit increases as long as the trip limit does not result in closure of this sector of the snapper grouper commercial fishery, precipitating the cancellation of other fishing trips that would no longer be profitable without greater amberjack harvests.

Table 4-51. Potential reduction in U.S. business activity associated with the estimated change in the commercial sector ex-vessel revenues relative to Alternative 1 (No Action).
All dollar values are in 2008 dollars.

			U.S. Business Activity Effects			
ALT	**Trip Limit**	**Revenue Change**	**Harvester Jobs**	**Total Jobs**	**Output Impacts**	**Income Impacts**
Black Sea Bass						
2a	500	$351,974	9	66	$4,634,085	$1,974,924
2b	750	$198,732	5	37	$2,616,511	$1,115,088
2c	1000	$112,400	3	21	$1,479,861	$630,677
2d	1250	$60,615	2	11	$798,056	$340,110
2e	1000/500	$181,646	5	34	$2,391,551	$1,019,216
2f	2000	$7,253	0	1	$95,494	$40,697
2g	2500	$1,224	0	0	$16,116	$6,868
2h	340	$500,975	13	94	$6,595,837	$2,810,971
12a		$182,650	5	34	$2,404,770	$1,024,849
12b		$96,343	2	18	$1,268,452	$540,581
12c		$212,757	5	40	$2,801,159	$1,193,780
12d		$47,168	1	9	$621,014	$264,660
Vermilion Snapper						
2	1000	$613,064	15	115	$8,071,602	$3,439,903
2a	1000/500	$754,685	19	142	$9,936,183	$4,234,538
3	**1500**	**$307,298**	**8**	**58**	**$4,045,882**	**$1,724,248**
3a	1500/500	$506,803	13	95	$6,672,568	$2,843,672
4	750	$883,164	22	166	$11,627,742	$4,955,435
4a	750/500	$1,013,606	25	191	$13,345,137	$5,687,343
5	500	$1,307,107	33	246	$17,209,369	$7,334,177
6	400	$1,533,469	38	288	$20,189,655	$8,604,296
Gag						
2	**1000**	**$101,893**	**3**	**19**	**$1,341,529**	**$571,724**
2a*	1000/100	$204,728	5	38	$2,695,449	$1,148,729
3	750	$194,942	5	37	$2,566,603	$1,093,818
3a*	750/100	$228,814	6	43	$3,012,565	$1,283,875
4	1000/100	unknown				

*Based on 2009 landings.

Table 4-52. Potential reduction in North Carolina business activity associated with the estimated change in the commercial sector ex-vessel revenues relative to Alternative 1 (No Action). All dollar values are in 2008 dollars.

			North Carolina Business Activity Effects			
ALT	**Trip Limit**	**Revenue Change**	**Harvester Jobs**	**Total Jobs**	**Output Impacts**	**Income Impacts**
Black Sea Bass						
2a	500	$227,585	4	31	$1,342,297	$722,583
2b	750	$132,218	2	18	$779,821	$419,792
2c	1000	$78,152	1	11	$460,939	$248,132
2d	1250	$45,175	1	6	$266,443	$143,431
2e	1000/500	$115,410	2	16	$680,688	$366,427
2f	2000	$6,554	0	1	$38,655	$20,809
2g	2500	$1,151	0	0	$6,791	$3,656
2h	340	$324,164	6	44	$1,911,919	$1,029,221
12a		$182,650	3	25	$1,077,270	$579,914
12b		$96,343	2	13	$568,231	$305,889
12c		$212,757	4	29	$1,254,841	$675,503
12d		$47,168	1	6	$278,197	$149,758
Vermilion Snapper						
2	1000	$233,326	4	32	$1,376,157	$740,810
2a	1000/500	$311,107	5	42	$1,834,909	$987,765
3	**1500**	**$116,950**	**2**	**16**	**$689,771**	**$371,316**
3a	1500/500	$223,796	4	30	$1,319,949	$710,552
4	750	$348,475	6	47	$2,055,308	$1,106,409
4a	750/500	$425,514	7	58	$2,509,682	$1,351,007
5	500	$546,337	9	74	$3,222,296	$1,734,620
6	400	$656,748	11	89	$3,873,501	$2,085,176
Gag						
2	**1000**	**$1,272**	**0**	**0**	**$7,504**	**$4,040**
2a*	1000/100	$5,018	0	1	$29,596	$15,932
3	750	$5,182	0	1	$30,565	$16,454
3a*	750/100	$6,021	0	1	$35,512	$19,117
4	1000/100	unknown				

*Based on 2009 landings.

Table 4-53. Potential reduction in South Carolina business activity associated with the estimated change in the commercial sector ex-vessel revenues relative to Alternative 1 (No Action). All dollar values are in 2008 dollars.

			South Carolina Business Activity Effects			
ALT	**Trip Limit**	**Revenue Change**	**Harvester Jobs**	**Total Jobs**	**Output Impacts**	**Income Impacts**
Black Sea Bass						
2a	500	$114,843	5	12	$533,905	$257,708
2b	750	$60,774	2	6	$282,538	$136,377
2c	1000	$30,819	1	3	$143,276	$69,157
2d	1250	$13,244	1	1	$61,569	$29,718
2e	1000/500	$52,186	2	6	$242,613	$117,105
2f	2000	$150	0	0	$698	$337
2g	2500	$0	0	0	$0	$0
2h	340	$164,147	7	17	$763,118	$368,345
12a		$182,650	7	19	$849,140	$409,867
12b		$96,343	4	10	$447,899	$216,194
12c		$212,757	9	23	$989,107	$477,427
12d		$47,168	2	5	$219,284	$105,845
Vermilion Snapper						
2	1000	$51,064	2	5	$237,395	$114,587
2a	1000/500	$83,296	3	9	$387,243	$186,916
3	**1500**	**$14,080**	**1**	**1**	**$65,458**	**$31,595**
3a	1500/500	$55,196	2	6	$256,606	$123,860
4	750	$94,880	4	10	$441,095	$212,910
4a	750/500	$128,457	5	14	$597,197	$288,258
5	500	$180,397	7	19	$838,665	$404,811
6	400	$229,538	9	24	$1,067,122	$515,083
Gag						
2	**1000**	**$47,944**	**2**	**5**	**$222,893**	**$107,587**
2a*	1000/100	$105,375	4	11	$489,888	$236,462
3	750	$100,815	4	11	$468,690	$226,229
3a*	750/100	$118,421	5	13	$550,539	$265,737
4	1000/100	unknown				

*Based on 2009 landings.

Table 4-54. Potential reduction in Georgia-northeast Florida (GA-NEFL) business activity associated with the estimated change in the commercial sector ex-vessel revenues relative to Alternative 1 (No Action).
All dollar values are in 2008 dollars.

			Georgia-northeast Florida Business Activity Effects			
ALT	**Trip Limit**	**Revenue Change**	**Harvester Jobs**	**Total Jobs**	**Output Impacts**	**Income Impacts**
Black Sea Bass						
2a	500	$9,546	0	1	$38,249	$20,322
2b	750	$5,741	0	0	$23,003	$12,222
2c	1000	$3,430	0	0	$13,743	$7,302
2d	1250	$2,196	0	0	$8,800	$4,676
2e	1000/500	$5,018	0	0	$20,107	$10,683
2f	2000	$549	0	0	$2,200	$1,169
2g	2500	$73	0	0	$291	$155
2h	340	$12,664	0	1	$50,746	$26,962
12a		$182,650	3	14	$731,879	$388,862
12b		$96,343	2	8	$386,046	$205,114
12c		$212,757	4	17	$852,517	$452,960
12d		$47,168	1	4	$189,002	$100,421
Vermilion Snapper						
2	1000	$327,726	6	26	$1,313,199	$697,729
2a	1000/500	$390,389	7	31	$1,564,289	$831,138
3	**1500**	**$176,268**	**3**	**14**	**$706,306**	**$375,274**
3a	1500/500	$276,985	5	22	$1,109,879	$589,701
4	750	$438,143	8	35	$1,755,637	$932,805
4a	750/500	$489,742	9	39	$1,962,396	$1,042,661
5	500	$577,316	10	46	$2,313,306	$1,229,106
6	400	$643,455	12	51	$2,578,325	$1,369,916
Gag						
2	**1000**	**$47,777**	**1**	**4**	**$191,442**	**$101,717**
2a*	1000/100	$82,293	1	7	$329,748	$175,202
3	750	$78,159	1	6	$313,184	$166,401
3a*	750/100	$91,325	2	7	$365,939	$194,431
4	1000/100	unknown				

*Based on 2009 landings.

Table 4-55. Potential reduction in central-southeast Florida business activity associated with the estimated change in the commercial sector ex-vessel revenues relative to Alternative 1 (No Action).
All dollar values are in 2008 dollars.

			Central-southeast Florida Business Activity Effects			
ALT	**Trip Limit**	**Revenue Change**	**Harvester Jobs**	**Total Jobs**	**Output Impacts**	**Income Impacts**
Black Sea Bass						
2a	500	$0	0	0	$0	$0
2b	750	$0	0	0	$0	$0
2c	1000	$0	0	0	$0	$0
2d	1250	$0	0	0	$0	$0
2e	1000/500	$0	0	0	$0	$0
2f	2000	$0	0	0	$0	$0
2g	2500	$0	0	0	$0	$0
2h	340	$0	0	0	$0	$0
12a		$182,650	3	14	$731,879	$388,862
12b		$96,343	2	8	$386,046	$205,114
12c		$212,757	4	17	$852,517	$452,960
12d		$47,168	1	4	$189,002	$100,421
Vermilion Snapper						
2	1000	$724	0	0	$2,900	$1,541
2a	1000/500	$1,004	0	0	$4,023	$2,138
3	**1500**	**$0**	**0**	**0**	**$0**	**$0**
3a	1500/500	$0	0	0	$0	$0
4	750	$1,176	0	0	$4,713	$2,504
4a	750/500	$1,004	0	0	$4,023	$2,138
5	500	$1,785	0	0	$7,153	$3,801
6	400	$2,092	0	0	$8,383	$4,454
Gag						
2	**1000**	**$4,900**	**0**	**0**	**$19,634**	**$10,432**
2a*	1000/100	$11,039	0	1	$44,233	$23,502
3	750	$10,649	0	1	$42,669	$22,671
3a*	750/100	$12,043	0	1	$48,256	$25,640
4	1000/100	unknown				

*Based on 2009 landings.

Table 4-56. Potential reduction in Florida Keys business activity associated with the estimated change in the commercial sector ex-vessel revenues relative to Alternative 1 (No Action). All dollar values are in 2008 dollars.

			Florida Keys Business Activity Effects			
ALT	**Trip Limit**	**Revenue Change**	**Harvester Jobs**	**Total Jobs**	**Output Impacts**	**Income Impacts**
Black Sea Bass						
2a	500	$0	0	0	$0	$0
2b	750	$0	0	0	$0	$0
2c	1000	$0	0	0	$0	$0
2d	1250	$0	0	0	$0	$0
2e	1000/500	$0	0	0	$0	$0
2f	2000	$0	0	0	$0	$0
2g	2500	$0	0	0	$0	$0
2h	340	$0	0	0	$0	$0
12a		$182,650	3	14	$731,879	$388,862
12b		$96,343	2	8	$386,046	$205,114
12c		$212,757	4	17	$852,517	$452,960
12d		$47,168	1	4	$189,002	$100,421
Vermilion Snapper						
2	1000	$224	0	0	$899	$478
2a	1000/500	$0	0	0	$0	$0
3	**1500**	**$0**	**0**	**0**	**$0**	**$0**
3a	1500/500	$0	0	0	$0	$0
4	750	$491	0	0	$1,966	$1,045
4a	750/500	$1,004	0	0	$4,023	$2,138
5	500	$1,272	0	0	$5,095	$2,707
6	400	$1,636	0	0	$6,554	$3,482
Gag						
2	**1000**	**$0**	**0**	**0**	**$0**	**$0**
2a*	1000/100	$0	0	0	$0	$0
3	750	$136	0	0	$546	$290
3a*	750/100	$0	0	0	$0	$0
4	1000/100	unknown				

*Based on 2009 landings.

4.5.2 Recreational Sector

This section provides estimates of the business activity associated with the potential changes in recreational fishing trips that may occur as a result of the proposed management changes. Similar to the commercial sector, business activity in the recreational sector is characterized in the form of FTE jobs, income impacts (wages, salaries, and self-employed income), and output (sales) impacts (gross business sales). Income impacts should not be added to output (sales) impacts because this would result in double counting. Job and output (sales) impacts, however, may be added across commercial and recreational sectors. In addition, the general discussions above for the commercial sector regarding the interpretation of changes in economic activities also apply to the recreational sector. It may only be noted that the primary factor motivating the changes in recreational business activities as presented in this section is the change in recreational trips, not ex-vessel revenues as with the commercial sector.

While some change (loss or gain) of business activity would be expected to result from any change in recreational trips, the full loss or gain of the estimates provided below should not be expected to occur as a result of the proposed management changes due to angler's response to regulations. For the recreational sector, the primary behavioral change not captured in the analysis is the potential to shift fishing trips and associated expenditures to alternative target species or recreational activities. In the event of less restrictive management, taking advantage of new fishing opportunities may entail platform or location switching (fishing from a different mode or port), resulting in new expenditure patterns; anglers may spend less money and/or make their purchases from different vendors and/or in different communities. As a result, expenditure patterns may change and businesses with reduced activity would suffer losses in business activity while businesses with increased activity would experience gains. All the business activity, however, would not be removed from the fishing industry or associated businesses as a whole in the event of more restrictive management, nor would all business activity be expected to be new in the event of less restrictive management. Alternatively, substitution of new recreational activities in lieu of fishing, either in the same or different communities, while economically harmful to the fishing industry, would represent gains in business activity to these alternative sectors. As a result, while the extent to which a community retains its character as a fishing destination may change, all of the business activity associated with any reduced fishing would not necessarily be lost to the community or region as a whole.

In the recreational sector, changes in business activities are summarized by fishing mode—shore mode, private/rental mode, and charter mode. The corresponding effect on the headboat sector cannot be estimated using the current model. It may be noted, though, that headboats account for a good number of recreational fishing trips (angler days) and harvests, so the potential impacts on this sector could be relatively larger than those on the charter sector. Although the changes in business activities are summarized by fishing mode, the underlying model takes into consideration the ripple effects on the support industries, such as bait and tackle shops, transportation, restaurants, hotels, etc. Estimates of the expected change in the recreational sector's business activity due to the spawning closure alternatives are shown in **Tables 4-57 to 4-60**. They refer only to expected effects of the alternatives for black sea bass spawning closure independent of the bag limit alternatives.

Table 4-57. Reductions in recreational business activities due to Sub-Alternative 12a. Output and value-added impacts are in 2008 dollars.

	North Carolina	South Carolina	Georgia/Florida	Total
	Shore Mode			
Target trips	0	0	1,386	1,386
Output	$0	$0	$39,595	$39,595
Value-added	$0	$0	$22,987	$22,987
Jobs	0	0	0	0
	Private/Rental Mode			
Target trips	876	5,070	2,640	8,586
Output	$47,815	$223,070	$41,247	$312,132
Value-added	$26,961	$130,158	$25,020	$182,139
Jobs	1	3	0	3
	Charter Mode			
Target trips	0	660	221	881
Output	$0	$222,570	$62,591	$285,161
Value-added	$0	$125,743	$36,825	$162,568
Jobs	0	3	1	3
	All Modes			
Target trips	876	5,730	4,247	10,853
Output	$47,815	$445,640	$143,432	$636,887
Value-added	$26,961	$255,901	$84,832	$367,695
Jobs	1	5	1	7

Table 4-58. Reductions in recreational business activities due to Sub-Alternative 12b. Output and value-added impacts are in 2008 dollars.

	North Carolina	South Carolina	Georgia/Florida	Total
	Shore Mode			
Target trips	0	0	682	682
Output	$0	$0	$19,483	$19,483
Value-added	$0	$0	$11,311	$11,311
Jobs	0	0	0	0
	Private/Rental Mode			
Target trips	746	3,605	1,896	6,247
Output	$40,719	$158,613	$36,147	$235,479
Value-added	$22,960	$92,549	$21,826	$137,335
Jobs	0	2	0	3
	Charter Mode			
Target trips	26	1,343	109	1,478
Output	$10,121	$452,897	$30,872	$493,890
Value-added	$5,680	$255,868	$18,164	$279,712
Jobs	0	6	0	6
	All Modes			
Target trips	772	4,948	2,687	8,407
Output	$50,841	$611,510	$86,502	$748,852
Value-added	$28,640	$348,417	$51,300	$428,357
Jobs	1	8	1	9

Table 4-59. Reductions in recreational business activities due to Sub-Alternative 12c. Output and value-added impacts are in 2008 dollars.

	North Carolina	South Carolina	Georgia/Florida	Total
	Shore Mode			
Target trips	0	0	1,386	1,386
Output	$0	$0	$39,595	$39,595
Value-added	$0	$0	$22,987	$22,987
Jobs	0	0	0	0
	Private/Rental Mode			
Target trips	1,191	6,182	3,237	10,610
Output	$65,009	$271,996	$57,098	$394,103
Value-added	$36,657	$158,706	$34,534	$229,897
Jobs	1	3	1	4
	Charter Mode			
Target trips	26	1,678	221	1,925
Output	$10,121	$565,868	$62,591	$638,580
Value-added	$5,680	$319,692	$36,825	$362,198
Jobs	0	7	1	8
	All Modes			
Target trips	1,217	7,860	4,844	13,921
Output	$75,130	$837,864	$159,283	$1,072,278
Value-added	$42,337	$478,398	$94,347	$615,082
Jobs	1	10	2	13

Table 4-60. Reductions in recreational business activities due to Sub-Alternative 12d. Output and value-added impacts are in 2008 dollars.

	North Carolina	South Carolina	Georgia/Florida	Total
	Shore Mode			
Target trips	0	0	0	0
Output	$0	$0	$0	$0
Value-added	$0	$0	$0	$0
Jobs	0	0	0	0
	Private/Rental Mode			
Target trips	315	1,112	597	2,024
Output	$17,194	$48,926	$15,852	$81,971
Value-added	$9,695	$28,548	$9,515	$47,758
Jobs	0	1	0	1
	Charter Mode			
Target trips	26	1,018	0	1,044
Output	$10,121	$343,298	$0	$353,419
Value-added	$5,680	$193,949	$0	$199,629
Jobs	0	4	0	5
	All Modes			
Target trips	341	2,130	597	3,068
Output	$27,315	$392,224	$15,852	$435,390
Value-added	$15,375	$222,497	$9,515	$247,387
Jobs	0	5	0	5

Changes in economic activities due to the bag limit alternatives are presented in **Tables 4-61 to 4-63**. The economic impacts of the bag limit alternatives are presented in a rather condensed form in order to capture the general sense of impacts of the many possible scenarios for bag limit analysis. In any case, the estimates contain the general features of the economic impacts of the bag limit alternatives on the recreational sector.

Table 4-61. Changes in recreational business activities due to the alternative bag limits relative to the 15-fish bag limit, assuming fishing year 2008-2009 as the base year. Output and value-added impacts are in 2008 dollars.

	7-Fish	5-Fish (Preferred)	3-Fish	2-Fish	1-Fish
			Shore		
Trips	-12	-45	-279	191	34
Output Impact	-$1,265	-$4,743	-$29,407	$20,132	$3,584
Value Added Impact	-$709	-$2,658	-$16,482	$11,283	$2,009
Jobs	0	0	0	0	0
			Private/Rental		
Trips	1,218	827	-2,681	1,027	-1,257
Output Impact	$49,817	$33,825	-$109,655	$42,005	-$51,412
Value Added Impact	$29,175	$19,809	-$64,219	$24,600	-$30,109
Jobs	1	0	-1	0	-1
			Charter		
Trips	596	643	-20	-260	-702
Output Impact	$220,337	$237,713	-$7,394	-$96,120	-$259,525
Value Added Impact	$125,613	$135,519	-$4,215	-$54,798	-$147,953
Jobs	3	3	0	-1	-3
			All Modes		
Trips	1,802	1,425	-2,980	958	-1,925
Output Impact	$268,890	$266,795	-$146,456	-$33,983	-$307,354
Value Added Impact	$154,079	$152,670	-$84,916	-$18,914	-$176,054
Jobs	3	3	-2	0	-4

Table 4-62. Changes in recreational business activities due to the alternative bag limits relative to the 15-fish bag limit, assuming fishing year 2009-2010 as the base year. Output and value-added impacts are in 2008 dollars.

	7-Fish	5-Fish (Preferred)	3-Fish	2-Fish	1-Fish
	Shore				
Trips	138	273	53	191	34
Output Impact	$14,545	$28,775	$5,586	$20,132	$3,584
Value Added Impact	$8,152	$16,127	$3,131	$11,283	$2,009
Jobs	0	0	0	0	0
	Private/Rental				
Trips	1,052	1,797	-69	1,027	-1,257
Output Impact	$43,028	$73,499	-$2,822	$42,005	-$51,412
Value Added Impact	$25,199	$43,044	-$1,653	$24,600	-$30,109
Jobs	0	1	0	0	-1
	Charter				
Trips	97	182	221	-260	-702
Output Impact	$35,860	$67,284	$81,702	-$96,120	-$259,525
Value Added Impact	$20,444	$38,358	$46,578	-$54,798	-$147,953
Jobs	0	1	1	-1	-3
	All Modes				
Trips	1,287	2,252	205	958	-1,925
Output Impact	$93,433	$169,558	$84,466	-$33,983	-$307,354
Value Added Impact	$53,795	$97,530	$48,056	-$18,914	-$176,054
Jobs	1	2	1	0	-4

Table 4-63. Changes in recreational business activities due to the alternative bag limits relative to the 15-fish bag limit, assuming fishing year 2010-2011 as the base year. Output and value-added impacts are in 2008 dollars.

	7-Fish	5-Fish (Preferred)	3-Fish	2-Fish	1-Fish
			Shore		
Trips	-12	44	554	-260	34
Output Impact	-$1,265	$4,638	$58,393	-$27,404	$3,584
Value Added Impact	-$709	$2,599	$32,727	-$15,359	$2,009
Jobs	0	0	1	0	0
			Private/Rental		
Trips	1,834	3,213	5,815	1,027	-1,257
Output Impact	$75,012	$131,414	$237,838	$42,005	-$51,412
Value Added Impact	$43,930	$76,962	$139,288	$24,600	-$30,109
Jobs	1	1	3	0	-1
			Charter		
Trips	-25	-4	-13	191	-702
Output Impact	-$9,242	-$1,479	-$4,806	$70,611	-$259,525
Value Added Impact	-$5,269	-$843	-$2,740	$40,255	-$147,953
Jobs	0	0	0	1	-3
			All Modes		
Trips	1,797	3,253	6,356	958	-1,925
Output Impact	$64,505	$134,573	$291,425	$85,212	-$307,354
Value Added Impact	$37,952	$78,718	$169,276	$49,496	-$176,054
Jobs	1	1	3	1	-4

5 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 1997) 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.

5.1 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 **(Section 4.0)**;
II. Which resources, ecosystems, and human communities are affected **(Section 3.0)**; 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 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. Therefore, the proper geographical boundary to consider effects on the biophysical environment is larger than the entire South Atlantic exclusive economic zone. The ranges of affected species are described in **Section 3.2**. The most measurable and substantial effects would be limited to the South Atlantic region.

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 species addressed in this amendment, landings data through 2009 was used in the subject biological 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 black sea bass, gag, vermilion snapper, and greater amberjack.

A. Past

The reader is referred to **Section 1.4** of this document for past regulatory activity for the relevant snapper grouper 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 16 (SAFMC 2009a) to the FMP for the Snapper Grouper Fishery of the South Atlantic Region was partially approved by the Secretary of Commerce. Amendment 16 includes provisions to extend the shallow water grouper spawning season closure, create a five month seasonal closure for vermilion snapper, require the use of dehooking gear if needed, reduce the aggregate bag limit from five to three grouper, and reduce the bag limit for black grouper and gag to one gag or black grouper combined within the aggregate bag limit. The expected effects of these measures include significant reductions in landings and overall mortality of several shallow water snapper grouper species including, gag, black grouper, red grouper, and vermilion snapper.

On September 1, 2009, Amendment 15B (SAFMC 2008b) to the FMP for the Snapper Grouper Fishery of the South Atlantic Region was approved by the Secretary. Management measures in Amendment 15B that affect gag, vermilion snapper, greater amberjack, and black sea bass include 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 (ACCSP) release, discard and protected species module to assess and monitor bycatch, allocations for snowy grouper, and management reference points for golden tilefish.

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.

Amendment 17B (SAFMC 2010b) to the FMP for the Snapper Grouper Fishery of the South Atlantic Region, which was approved on December 22, 2010, includes a deepwater snapper grouper closure seaward of 240 ft in addition to establishing annual catch limits (ACLs) and accountability measures (AMs) for species experiencing overfishing, including vermilion snapper, black sea bass, and gag.

Amendment 17A (SAFMC 2010a) to the FMP for the Snapper Grouper Fishery of the South Atlantic Region, which was approved for implementation on October 27, 2010, includes measures to end overfishing of red snapper.

C. Reasonably Foreseeable Future

Amendment 18A to the FMP for the Snapper Grouper Fishery of the South Atlantic Region, which is currently under development, would limit effort in the black sea bass and golden tilefish fisheries, change the golden tilefish fishing year, and improve the accuracy and timing of fisheries statistics

The Comprehensive ACL Amendment includes ACLs and AMs for federally-managed species not undergoing overfishing in other FMPs including Snapper Grouper. Actions contained within the ACL Amendment include: (1) Removal of species from the snapper grouper fishery management unit; (2) designating ecosystem component species; (3) allocations; (4) management measures to limit recreational and commercial sectors to their ACLs; (5) AMs; and (5) any necessary modifications to the range of regulations.

II. Non-Council and other non-fishery related actions, including natural events affecting snapper-grouper 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.

How global climate changes will affect Gulf of Mexico and South Atlantic fisheries is unclear. Climate change can impact marine ecosystems through ocean warming by increased thermal stratification, reduced upwelling, sea level rise; and through 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, is not expected to impact fisheries operating the South Atlantic. Oil from the spill site has not been detected in the South Atlantic region, and is not likely to pose a threat to South Atlantic snapper grouper species included in this regulatory amendment.

AFFECTED ENVIRONMENT

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 trends in condition of gag, vermilion snapper, black sea bass, and greater amberjack, are documented through the Southeast Data, Assessment and Review (SEDAR) process. The status of each of these stocks is described in detail in **Section 3.3** of this document.

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

Numeric values of overfishing and overfished thresholds have been updated in previous amendments for black sea bass, vermilion snapper, and gag. These values includes maximum sustainable yield (MSY), the fishing mortality rate that produces MSY (F_{MSY}), the biomass or biomass proxy that supports MSY (B_{MSY}), the minimum stock size threshold below which a stock is considered to be overfished (MSST), the maximum fishing mortality threshold above which a stock is considered to be undergoing overfishing (MFMT), and optimum yield (OY).

Applicable stock assessment sources include SEDAR Update 1 (2005) for black sea bass; SEDAR 10 (2006) for gag; SEDAR 17 (2008) for vermilion snapper; and SEDAR 15 (2007) for greater amberjack. Of these species gag, black sea bass, and vermilion snapper, have been determined to be undergoing overfishing according to their respective overfishing and overfished definitions. Greater amberjack is not undergoing overfishing and is not overfished. Detailed discussions of the science and processes used to determine the stock status of these species is contained in the previously mentioned information sources and are hereby incorporated by reference.

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

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

For a detailed discussion of the baseline conditions of each of the species addressed in this amendment the reader is referred to those stock assessment and stock information sources referenced in **Item Number 6** of this CEA.

DETERMINING THE ENVIRONMENTAL CONSEQUENCES OF CUMULATIVE EFFECTS

8. Identify the important cause-and-effect relationships between human activities and resources, ecosystems, and human communities (Table 5-1).

Table 5-1. 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
1960s-1983	Growth overfishing of many reef fish species.	Declines in mean size and weight of many species including black sea bass.
August 1983	4" trawl mesh size to achieve a 12" TL commercial vermilion snapper minimum size limit (SAFMC 1983).	Protected youngest spawning age classes.
Pre-January 12, 1989	Habitat destruction, growth overfishing of	Damage to snapper grouper habitat, decreased yield per recruit of vermilion

Time period/dates	Cause	Observed and/or Expected Effects
	vermilion snapper.	snapper.
January 1989	Trawl prohibition to harvest fish (SAFMC 1988a & b).	Increase yield per recruit of vermilion snapper; eliminate trawl damage to live bottom habitat.
Pre-January 1, 1992	Overfishing of many reef species including vermilion snapper, and gag.	Spawning stock ratio of these species is estimated to be less than 30% indicating that they are overfished.
January 1992	Prohibited gear: fish traps south of Cape Canaveral, FL; entanglement nets; longline gear inside of 50 fathoms; powerheads and bangsticks in designated SMZs off SC. Size/Bag limits: 10" TL vermilion snapper (recreational only); 12" TL vermilion snapper (commercial only); 10 vermilion snapper/person/day; aggregate grouper bag limit of 5/person/day; and 20" TL gag, red, black, scamp, yellowfin, and yellowmouth grouper size limit (SAFMC 1991a).	Protected smaller spawning age classes of vermilion snapper.
Pre-June 27, 1994	Damage to *Oculina* habitat.	Noticeable decrease in numbers and species diversity in areas of *Oculina* off FL
July 1994	Prohibition of fishing for and retention of snapper grouper species (HAPC renamed OECA; SAFMC 1993)	Initiated the recovery of snapper grouper species in OECA.
1992-1999	Declining trends in biomass and overfishing continue for a number of snapper grouper species including vermilion snapper and gag.	Spawning potential ratio for vermilion snapper and gag is less than 30% indicating that they are overfished.
February 24, 1999	Gag and black grouper: 24" total length (recreational and commercial); 2 gag or black grouper bag limit within 5 grouper aggregate; March-April commercial closure.	F for gag vermilion snapper remains declines but is still above F_{MSY}.

Time period/dates	Cause	Observed and/or Expected Effects
	Vermilion snapper: 11” total length (recreational). Aggregate bag limit of no more than 20 fish/person/day for all snapper grouper species without a bag limit (SAFMC 1998a).	
October 23, 2006	Snapper grouper FMP Amendment 13C (SAFMC 2006)	Commercial vermilion snapper quota set at 1.1 million pounds gutted weight; recreational vermilion snapper size limit increased to 12” TL to prevent vermilion snapper overfishing
Effective February 12, 2009	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	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.	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 July 29, 2009	Snapper grouper FMP Amendment 16 (SAFMC 2009a)	Protect spawning aggregations and snapper grouper in spawning condition by increasing the length of the spawning season closure, decrease discard mortality by requiring the use of dehooking tools, reduce overall harvest of gag and vermilion snapper to end overfishing.
Effective Date January 4, 2010	Red Snapper Interim Rule	Prohibit commercial and recreational harvest of red snapper from January 4, 2010, to June 2, 2010 with a possible 186-day extension. Reduce overfishing of red snapper while long-term measures to end overfishing are addressed in Amendment 17A.
Effective Date December 4, 2010	Snapper Grouper FMP Amendment 17A (SAFMC 2010a).	SFA parameters for red snapper; ACLs and ACTs; management measures to limit recreational and commercial sectors to their ACTs; accountability measures. Establish

Time period/dates	Cause	Observed and/or Expected Effects
		rebuilding plan for red snapper.
Effective Date January 31, 2011	Snapper Grouper Amendment 17B (SAFMC 2010b)	ACLs and ACTs; management measures to limit recreational and commercial sectors to their ACTs; AMs, for species undergoing overfishing.
Target 2012	Snapper Grouper FMP Amendment 18A (under dev)	Prevent overexploitation in the black sea bass and golden tilefish fisheries, improve data collection timeliness and data quality.
Target 2012	Snapper Grouper Amendment 21 (under dev)	Establish a catch share program for quota-managed species in the South Atlantic
Target 2011	Comprehensive ACL Amendment (under dev)	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.
Target 2012	Amendment 20 (Wreckfish) (under dev)	Review the current ITQ program and update the ITQ program as necessary to comply with MSA LAPP requirements.
Target 2013	Snapper Grouper Amendment 22 (under dev)	Develop a long-term management program for red snapper in the South Atlantic.
Target 2012	Amendment 24 (under dev)	Establish are rebuilding plan for red grouper, which are overfished and undergoing overfishing.

9. Determine the magnitude and significance of cumulative effects.

Proposed management actions, as summarized in **Section 2** of this document, would establish or modify trip limits for vermilion snapper, gag, and greater amberjack, establish a split season quota for black sea bass, and reduce the black sea bass recreational bag limit. Because these species are already managed using a system of quotas, modifying harvest allowances per trip would not alter the overall annual harvest of the species, and therefore, cumulative effect on the biophysical environment would be minimal when compared to the status quo situation. These management actions are expected to eliminate or minimize the derby-style nature of these species components of the snapper grouper fishery. Detailed discussions of the magnitude and significance of the preferred alternatives appear in **Section 4** of this consolidated document.

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 action are, and will continue to be, monitored through collection of data by NOAA Fisheries Service, states, stock assessments and stock assessment updates, life history studies, and other scientific observations.

5.2 Socioeconomic

The cumulative short-term economic and social effect of recent Snapper Grouper Amendment 13C (SAFMC 2006), Amendment 16 (SAFMC 2009a), Amendment 17B (SAFMC 2010b) and Amendment 17A (SAFMC 2010a) as well as Amendment 18A (under development) and the Comprehensive ACL Amendment (under development) is expected to be negative while the long-term economic and social outcome is expected to be positive. Regulatory Amendment 9 is expected to continue this trend. Recent amendments restrict aggregate quotas for all species, impose new trip limits and bag limits, implement accountability measures, and create area and seasonal closures. A number of commercial and recreational businesses are expected to close. A decrease in overall participation is also expected in the form of the number of individual vessels. It is logical to expect that the remaining vessels will switch from the most severely restricted fisheries to those with higher trip limits or aggregate quotas or bag limits, perhaps creating or exasperating derby fisheries. Season length for commercial and recreational fisheries will decrease further for some species.

Participation in the black sea bass and golden tilefish commercial fisheries is expected to increase. As a result, in general, short-term economic benefits are expected to decline for commercial and for-hire participants while declines are expected in consumer surplus for private recreational fishermen. Regulatory Amendment 9 will increase these negative impacts. However, over the long-term, economic and social benefits are expected to be positive. Regulatory Amendment 9 will increase long-term economic benefits

6 Other Things to Consider

6.1 Unavoidable Adverse Effects

Regulatory Amendment 9 includes no actions that are expected to result in unavoidable adverse effects.

6.2 Effects of the Fishery on the Essential Fish Habitat

The biological impacts of the proposed actions are described in Section 4.0, including impacts on habitat. No actions proposed in this amendment are anticipated to have any adverse impact on essential fish habitat (EFH) or EFH-Habitat of Particular Concern (EFH-HAPC) for managed species including species in the snapper grouper complex. Any additional impacts of fishing on EFH identified during the public hearing process will be considered, therefore the Council has determined no new measures to address impacts on EFH are necessary at this time. The Council's adopted habitat policies, which may directly affect the area of concern, are available for download through the Habitat/Ecosystem section of the Council's website: www.safmc.net.

NOTE: The Final EFH Rule, published on January 17, 2002, (67 FR 2343) replaced the interim Final Rule of December 19, 1997 on which the original EFH and EFH-HAPC designations were made. The Final Rule directs the Councils to periodically update EFH and EFH-HAPC information and designations within fishery management plans. As was done with the original Habitat Plan, a series of technical workshops were conducted by Council habitat staff and a draft plan that includes new information has been completed pursuant to the Final EFH Rule.

6.3 Damage to Ocean and Coastal Habitats

The alternatives and proposed actions are not expected to have any adverse effect on the ocean and coastal habitat.

Management measures implemented in the original Snapper Grouper Fishery Management Plan through Amendment 7 (SAFMC 1994a) combined have significantly reduced the impact of the snapper grouper fishery on essential fish habitat (EFH). The Council has reduced the impact of the fishery and protected EFH by prohibiting the use of poisons and explosives; prohibiting use of fish traps and entanglement nets in the exclusive economic zone; banning use of bottom trawls on live/hard bottom habitat north of Cape Canaveral, Florida; restricting use of bottom longline to depths greater than 50 fathoms north of St. Lucie Inlet; and prohibiting use of black sea bass pots south of Cape Canaveral, Florida. These gear restrictions have significantly reduced the impact of the fishery on coral and live/hard bottom habitat in the South Atlantic Region.

Additional management measures in Amendment 8 (SAFMC 1997), including specifying allowable bait nets and capping effort, have protected habitat by making existing regulations more enforceable. Establishing a controlled effort program limited overall fishing effort and to the extent there is damage to the habitat from the fishery (e.g. black sea bass pots, anchors from fishing vessels, impacts of weights used on fishing lines and bottom longlines), limited such impacts.

In addition, measures in Amendment 9 (SAFMC 1998a), that include further restricting longlines to retention of only deepwater species and requiring that black sea bass pot have escape panels with degradable fasteners, reduce the catch of undersized fish and bycatch and ensure that the pot, if lost, will not continues to “ghost” fish. Amendment 13C (SAFMC 2006) increased mesh size in the back panel of pots, which has reduced bycatch and retention of undersized fish. Amendment 15B (SAFMC 2008b) implemented sea turtle bycatch release equipment requirements, and sea turtle and smalltooth sawfish handling protocols and/or guidelines in the permitted commercial and for-hire snapper grouper fishery.

Amendment 16 (SAFMC 2009a), implemented an action to reduce bycatch by requiring fishermen use dehooking devices. Limiting the overall fishing mortality reduces the likelihood of over-harvesting of species with the resulting loss in genetic diversity, ecosystem diversity, and sustainability.

Measures adopted in the Coral and Shrimp FMPs have further restricted access by fishermen that had potential adverse impacts on essential snapper grouper habitat. These measures include the designation of the *Oculina* Bank HAPC and the rock shrimp closed area (see the Shrimp and Coral FMP/Amendment documents for additional information).

The Council’s Comprehensive Habitat Amendment (SAFMC 1998b) contains measures that expanded the *Oculina* Bank Habitat of Particular Concern (HAPC) and added two additional satellite HAPCs. Amendment 14 (SAFMC 2007), established marine protected areas where fishing for or retention of snapper grouper species would be prohibited.

7 List Of Preparers

Name	Title	Agency	Division	Location
David Dale	EFH Specialist	NMFS	HC	SERO
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Stephen Holiman	Economist	NMFS	SF	SERO
David Keys	NEPA Specialist	NMFS	N/A	SERO
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Jack McGovern	Fishery Scientist	NMFS	SF	SERO
Kate Michie	Fishery Management Plan Coordinator	NMFS	SF	SERO
Brent Stoffel	Anthropologist	NMFS	N/A	SEFSC
Scott Crosson	Economist	NMFS	N/A	SEFSC Beaufort Lab
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Gregg Waugh	Deputy Director	SAFMC	N/A	SAFMC

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

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8 Listing of Agencies and Persons Consulted

Responsible Agency

Regulatory Amendment 9:
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Environmental Assessment:
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List of Agencies, Organizations, and Persons Consulted
SAFMC Law Enforcement Advisory Panel
SAFMC Snapper Grouper Advisory Panel
SAFMC Scientific and Statistical Committee
SAFMC Education and Outreach 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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Appendix A. Alternatives Considered but Rejected For Further Analysis

Management and Harvest Measures for Black Sea Bass

Alternative 3. Establish separate trip limits for the pot and other fisheries (hook and line, spear).
Alternative 3a. Establish a 500 pounds gw (590 pounds ww) trip limit for pot fishery and a 50 pounds gw (59 pounds ww) trip limit for other fisheries.
Alternative 3b. Establish a 750 pounds gw (885 pounds ww) trip limit for pot fishery and a 75 pounds gw (89 pounds ww) trip limit for other fisheries.
Alternative 3c. Establish a 1,000 pounds gw (1,180 pounds ww) trip limit for pot fishery and a 100 pounds gw (118 pounds ww) trip limit for other fisheries.
Alternative 3d. Establish a trip limit for the pot (340 pounds gw) and other fisheries (17 pounds gw) that will keep the fishery open all year.

Discussion: This alternative combines commercial pot limits along with hook-and-line and spear limits. The Council wanted to get rid of the trip limits for the other fisheries and focus only on limits for the pot fishery.

Trip Limits for gag Grouper

Alternative 4. Establish a 500 pounds gw (590 pounds ww) trip limit.
Alternative 5. Establish a 250 pounds gw (295 pounds ww) trip limit.
Alternative 6. Establish a 100 pounds gw (118 pounds ww) trip limit.
Alternative 7. Apply Alternatives 2-6 to red grouper, black grouper, and gag.

Discussion: The Council discussed Alternative 4-7 at their June 2010 meeting and indicated they should be moved to the Considered but Rejected Appendix. Analyses indicated that trip limits less than 750 pounds were not needed for gag at this time since the extended spawning season closure provided for reductions. Further, the Council considered unnecessary to address combined trip limits for gag, red and black grouper since these species have been assessed and can be managed individually.

Trip Limits for Greater Amberjack

Alternative 3. Change the commercial trip limit for greater amberjack to 2,000 pounds gw (2,080 pounds ww) for vessels making multi-day trips north of Cape Canaveral. For all other trips the 1,000 pounds trip limit would apply.
Alternative 4. Change the commercial trip limit for greater amberjack to 2,500 pounds gw (2,600 pounds ww) for vessels making multi-day trips north of Cape Canaveral. For all other trips the 1,000 pounds trip limit would apply.

Discussion: The Council was concerned that enforcing the proposed trip limits in Alternatives 3 & 4 would not be feasible because vessels could easily traverse back and forth to points north and south of the Cape Caveral boundary.

Appendix B. Initial Regulatory Flexibility Analysis

Introduction

The purpose of the Regulatory Flexibility Act (RFA) is to establish a principle of regulatory issuance that agencies shall endeavor, consistent with the objectives of the rule and of applicable statutes, to fit regulatory and informational requirements to the scale of businesses, organizations, and governmental jurisdictions subject to regulation. To achieve this principle, agencies are required to solicit and consider flexible regulatory proposals and to explain the rationale for their actions to assure that such proposals are given serious consideration. The RFA does not contain any decision criteria; instead, the purpose of the RFA is to inform the agency, as well as the public, of the expected economic impacts of various alternatives contained in the FMP or amendment (including framework management measures and other regulatory actions). The RFA is also intended to ensure that the agency considers alternatives that minimize the expected impacts while meeting the goals and objectives of the FMP and applicable statutes.

With certain exceptions, the RFA requires agencies to conduct a regulatory flexibility analysis for each proposed rule. The regulatory flexibility analysis is designed to assess the impacts various regulatory alternatives would have on small entities, including small businesses, and to determine ways to minimize those impacts. In addition to analyses conducted for the RIR, the regulatory flexibility analysis provides: 1) A statement of the reasons why action by the agency is being considered; 2) a succinct statement of the objectives of, and legal basis for the proposed rule; 3) a description and, where feasible, an estimate of the number of small entities to which the proposed rule will apply; 4) a description of the projected reporting, record-keeping, and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirements of the report or record; 5) an identification, to the extent practical, of all relevant Federal rules which may duplicate, overlap, or conflict with the proposed rule; and 6) a description of any significant alternatives to the proposed rule which accomplish the stated objectives of applicable statutes and which minimize any significant economic impact of the proposed rule on small entities.

Additional information on the description of affected entities was presented in **Section 3.7.3,** and additional information on the expected economic impacts of the proposed actions was presented in **Chapters 4** and **5**.

Statement of Need for, Objectives of, and Legal Basis for the Rule

The purpose and need, issues, problems, and objectives of the proposed rule are presented in **Sections 1.1 and 1.2**. The purpose of this amendment is to prevent the potential formation of derby fisheries for black sea bass, vermilion snapper, greater amberjack, and gag, through the implementation of trip limits, split season quotas, and spawning season closures.   This amendment addresses the need to comply with the Magnuson-Stevens Fishery Conservation and Management Act's national standards, to ensure equity in harvest opportunities, and promote safety at sea through the prevention of derby style fisheries, while minimizing adverse socioeconomic impacts. The Magnuson-Stevens Fishery Conservation and Management Act, as amended, provides the statutory basis for the proposed rule.

Identification of All Relevant Federal Rules Which May Duplicate, Overlap or Conflict with the Proposed Rule

No duplicative, overlapping, or conflicting Federal rules have been identified. Previous amendments, whether already implemented or in the process of being implemented, have been considered in designing the various actions in this amendment.

Description and Estimate of the Number of Small Entities to Which the Proposed Rule will Apply

This proposed action is expected to directly affect commercial fishers and for-hire operators. The SBA has established size criteria for all major industry sectors in the U.S. including fish harvesters and for-hire operations. A business involved in fish harvesting is classified as a small business if it is independently owned and operated, is not dominant in its field of operation (including its affiliates), and has combined annual receipts not in excess of $4.0 million (NAICS code 114111, finfish fishing) for all its affiliated operations worldwide. For for-hire vessels, the other qualifiers apply and the annual receipts threshold is $7.0 million (NAICS code 713990, recreational industries).

From 2007-2009, an average of 895 vessels per year had valid permits to operate in the commercial snapper grouper fishery. Of these vessels, 751 held transferable permits and 144 held non-transferable permits. On average, 797 vessels landed snapper grouper species, generating dockside revenues of approximately $14.514 million (2008 dollars). Each vessel, therefore, generated an average of approximately $18,000 in gross revenues from snapper grouper. Gross dockside revenues by area are distributed as follows: $4.054 million in North Carolina, $2.563 million in South Carolina, $1.738 million in Georgia/Northeast Florida, $3.461 million in central and southeast Florida, and $2.695 million in the Florida Keys. Vessels that operate in the snapper grouper fishery may also operate in other fisheries, the revenues of which cannot be determined with available data and are not reflected in these totals.

Based on revenue information, all commercial vessels affected by the proposed action can be considered small entities.

From 2007-2009, an average of 1,797 vessels had valid permits to operate in the snapper grouper for-hire fishery, of which 82 are estimated to have operated as headboats. The for-hire fleet is comprised of charterboats, which charge a fee on a vessel basis, and headboats, which charge a fee on an individual angler (head) basis. The charterboat annual average gross revenue is estimated to range from approximately $62,000-$84,000 for Florida vessels, $73,000-$89,000 for North Carolina vessels, $68,000-$83,000 for Georgia vessels, and $32,000-$39,000 for South Carolina vessels. For headboats, the corresponding estimates are $170,000-$362,000 for Florida vessels, and $149,000-$317,000 for vessels in the other states.

Based on these average revenue figures, all for-hire operations that would be affected by the proposed action can be considered small entities.

Some fleet activity, i.e., multiple vessels owned by a single entity, may exist in both the commercial and for-hire snapper grouper sectors but its extent is unknown, and all vessels are treated as independent entities in this analysis. A recent commenter on this amendment indicated he owns 12 snapper grouper commercial permits. For this fleet to reach the $4 million threshold, each permitted vessel would have to generate yearly receipts of approximately $333,000. It is not known whether or not this is the case, but it appears such amount is too high given the above noted average gross revenues per vessel.

Description of the projected reporting, record-keeping and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirement and the type of professional skills necessary for the preparation of the report or records

The proposed action would not introduce any changes to reporting, record-keeping, and other compliance requirements which are currently required.
Substantial Number of Small Entities Criterion

The proposed action is expected to directly affect all Federally permitted commercial and for-hire vessels that operate in the South Atlantic snapper grouper fishery. All directly affected entities have been determined, for the purpose of this analysis, to be small entities. Therefore, it is determined that the proposed action will affect a substantial number of small entities.

Significant Economic Impact Criterion

The outcome of 'significant economic impact' can be ascertained by examining two issues: disproportionally and profitability.

Disproportionally: Do the regulations place a substantial number of small entities at a significant competitive disadvantage to large entities?

All entities that are expected to be affected by the proposed rule are considered small entities, so the issue of disproportional effects on small versus large entities does not arise in the present case.

Profitability: Do the regulations significantly reduce profit for a substantial number of small entities?

The proposed action on the commercial black sea bass sector would specify a commercial ACL (quota) to be split between the June-November and December-May seasons. In addition, any unused portion of the ACL (quota) from the first part of the fishing year would be carried over to the second portion of the fishing year. A qualitative discussion of the effects of these measures indicates that profits to the commercial fishing fleet would not deteriorate as would occur under the no action alternative by breaking up the derby and potentially maintaining a relatively higher price via a longer fishing season. The proposed action on the recreational black sea bass sector would impose a 5-fish bag limit per person per day. Relative to the current bag limit of 15-fish per person per day with ACL-based closure, this measure would be expected to increase for-hire vessel profits (net operating revenues) annually from approximately $78,000 to $164,000 assuming no trip cancellation during the open season, or from approximately $45,000 to $131,000 assuming some trip cancellations during the open season.

The proposed action to establish a 1,500 lb gw commercial trip limit for vermilion snapper would reduce the gross revenues of commercial vessels by approximately $306,000 annually. Profits would be reduced accordingly. Among the trip limit alternatives, however, this measure is expected to result in the lowest revenue losses. Commercial fishing vessels in North Carolina and Georgia/Northeast Florida would experience the largest revenue losses compared to those of other states/areas in the South Atlantic.

The proposed action to establish a 1,000 lb gw commercial trip limit for gag would reduce the gross revenues of commercial fishing fleet by approximately $102,000 annually and likely also fleet profits. However, this action could lengthen the season so that revenues and profits could increase over time relative to the no action alternative. The largest revenue (and profit) reductions would fall on vessels in South Carolina and Georgia/Northeast Florida.

The proposed action to increase the commercial trip limit for greater amberjack to 1,200 lb gw is expected to increase gross revenues of commercial vessels annually. Short-term profits are also expected to increase. Over time, the net result on vessel revenues and profits would depend on the resulting fishing season length under the higher trip limit.

Description of Significant Alternatives

The following comprise the proposed action:

a. Specify commercial ACLs (quotas) for June-November and December-May based on 2006-2009 landings, and carry over unused portion of the commercial ACL from the first part of the fishing year to the second portion of the fishing year.
b. Reduce the recreational bag limit from 15 to 5 black sea bass per person per day.
c. Establish a 1,500 lb gw commercial trip limit for vermilion snapper.
d. Establish a 1,000 lb gw commercial trip limit for gag.
e. Increase the commercial trip limit for greater amberjack to 1,200 lb gw.

Thirteen alternatives, including two alternatives for the proposed action, were considered for the harvest management of black sea bass.

1. The first alternative to the proposed action is the no action alternative. This alternative would not address the derby concern in the commercial sector of the black sea bass segment of the snapper grouper fishery.
2. The second alternative to the proposed action would establish a commercial trip limit, with 8 sub-alternatives.
    a. The first sub-alternative would be a 500 lb gw trip limit;
    b. the second, a 750 lb gw trip limit;

c. the third, a 1,000 lb gw trip limit;
d. the fourth, a 1,250 lb gw trip limit;
e. the fifth, a 1,000 lb gw trip limit but reduced to 500 lb gw when 75% of the quota is met;
f. the sixth, a 2,000 lb gw trip limit;
g. the seventh, a 2,500 lb gw trip limit; and,
h. the eighth, a 340 lb gw trip limit.

Based on the input received during public hearings, from the AP, from the SEP and SSC, and the fact that the stock is undergoing an assessment (SEDAR 25) -- the results of which will be available by the end of 2011-- the Council chose not to implement trip limits for the black sea bass fishery at this time. The Council concluded the preferred alternative best meets the purpose and need to prevent the progressive shortening of the fishing season while ensuring equity in harvest opportunities, promoting safety at sea, and minimizing adverse socioeconomic impacts.

3. The third alternative to the proposed action would retain the June-May fishing year and specify separate commercial ACLs for June-December and January-May based on 2006-2009 landings. This is similar to the proposed action, except that the first sub-season ends in December, with January being the starting month of the second sub-season. The effects of this alternative on small entities are about the same as those of the proposed action, except that the proposed action would allow the second sub-season to start, with enough quota left, at the time when the traditional winter pot fishery takes place.
4. The fourth alternative to the proposed action would change the black sea bass fishing year to November-October and specify separate commercial ACLs for November-April and May-October. The Council recognized the distributional effects of changing the fishing year, and decided to address this issue, together with a regional approach to management of black sea bass, after a new stock assessment is completed in late 2011.
5. The fifth alternative to the proposed action would change the black sea bass fishing year to January-December and specify separate commercial ACLs for January-June and July-December. This alternative raises the same issue as the fourth alternative to the proposed action for which the Council decided to consider the fishing year issue, together with regional approach to management, in the future.
6. Under any of the second through the fifth alternatives to the proposed action, the sixth alternative to the proposed action would allow a carry-over of unused portion of the ACL from the second part of the fishing year to the next fishing year. This alternative has the potential to result in exceeding the ACL for the next year that would trigger application of accountability measures, resulting in revenue and profit losses to the commercial fishing fleet. In addition, this alternative could result in exceeding other fishery benchmarks and the stock could be considered to experience overfishing. More restrictive regulations would follow that would only add more revenue and profit losses to the fishing fleet.
7. Under any of the second through the fifth alternatives to the proposed action, the seventh alternative to the proposed action would close fishing for black sea bass with pots, but not with other gear, when all but 100,000 lb gw of the commercial ACL for the sub-season is harvested and would allow all allowable gear types in the next sub-season. The Council decided not to impose specific gear restriction at this time partly due to the problem of monitoring catches by gear type on a timely basis.

8. The eighth alternative to the proposed action is similar to the seventh alternative to the proposed action, except that the amount of ACL left is 50,000 lb gw for triggering the closure of the black sea bass pot sector. The Council decided not to impose specific gear restriction at this time partly due to the problem of monitoring catches by gear type on a timely basis.
9. The ninth alternative to the proposed action would close the black sea bass pot sector when 90% of the commercial ACL (quota) is met. The Council decided not to impose specific gear restriction at this time partly due to the problem of monitoring catches by gear type on a timely basis.
10. The tenth alternative to the proposed action would establish a spawning season closure, with four sub-alternatives.
    a. The first sub-alternative would implement a March-April closure applicable to both the commercial and recreational sector;
    b. the second, an April-May closure;
    c. the third, a March-May closure; and,
    d. the fourth, a May closure.

    A spawning season closure for black sea bass affecting both the commercial and recreational sectors was considered as a possible tool to extend the fishing season and benefit the stock. However, there was strong opposition from the public toward such a measure given additional proposed measures. While many fishermen are in favor of curbing harvest during the spawning season, they felt it would be best accomplished with a modification to the fishing year. Moreover, the black sea bass stock is under a rebuilding schedule, there are indications that the stock is rebuilding, and a stock assessment is currently underway.
11. The eleventh alternative to the proposed action would modify the current recreational bag limit of 15 fish per person per day for black sea bass, with 5 sub-alternatives one of which is the proposed action. The first sub-alternative would reduce the bag limit to 7 fish per person per day; the second, 5 fish per person per day; the third, 3 fish per person per day; the fourth, 2 fish per person per day; and the fifth, 1 fish per person per day. Relative to the 15-fish bag limit and depending on the baseline year used, the bag limit alternatives would have varying effects on the annual net operating revenues of the for-hire fleet. The first sub-alternative would result in an increase in net operating revenues approximately from $19,000 to $129,000 annually; the second sub-alternative, from negative $62,000 to positive $48,000 annually; the third sub-alternative, negative $97,000 annually; and, the fourth sub-alternative, negative $226,000 annually. These effects are less than the positive effects of the proposed action. The Council's decision on their proposed action of a 5-fish bag limit per person per day was based on public support and the fact that a large percentage of recreational trips result in approximately 5 black sea bass per person. Moreover, the Council considered this proposed action as an interim measure until results of the stock assessment are available in late 2011.

Seven alternatives, including the proposed action, were considered for commercial vermilion snapper trip limit.

1. The first alternative to the proposed action is the no action alternative. This alternative would not address the derby concern in the commercial sector of the vermilion snapper segment of the snapper grouper fishery.

2. The second alternative to the proposed action would establish a 1,000 lb gw trip limit, with one sub-alternative that would reduce the trip limit to 500 lb gw when 75% of the quota is met. This alternative would lengthen the season relative to the no action alternative, but it would bring about a reduction in short-term revenues of approximately $611,000 annually without the sub-alternative, or $752,000 annually with the sub-alternative. These reductions are larger than those that would occur under the proposed action.
3. The third alternative to the proposed action would establish a 1,500 lb gw trip limit, and reduce the trip limit to 500 lb gw when 75% of the quota is met. This alternative would bring about a reduction in short-term revenues of approximately $505,000. This revenue reduction is larger than what would occur under the proposed action.
4. The fourth alternative to the proposed action would establish a 750 lb gw trip limit, with one sub-alternative that would reduce the trip limit to 400 lb gw when 75% of the quota is met. Compared to the proposed action, this alternative would result in short-term revenue reductions of approximately $880,000 annually without the sub-alternative, or $1,013,000 annually with the sub-alternative.
5. The fifth alternative to the proposed action would establish a 500 lb gw trip limit. This alternative would result in short-term revenue reductions of approximately $1,302,000 annually, much larger than those under the proposed action.
6. The sixth alternative to the proposed action would establish a 400 lb gw trip limit. Compared to the proposed action, this alternative would result in larger revenue reductions of approximately $1,528,000 annually.

Five alternatives, including the proposed action, were considered for commercial gag trip limit.

1. The first alternative to the proposed action is the no action alternative. This alternative would not address the derby concern in the commercial sector of the gag segment of the snapper grouper fishery.
2. The second alternative to the proposed action would establish a 1,000 lb gw trip limit that would reduce to 100 lb gw when 75% of the commercial ACL is projected to be met. This alternative would result in short-term revenue reductions of approximately $392,000 annually when based on 2007 landings, or $204,000 annually when based on 2009 landings.
3. The third alternative to the proposed action would establish a 750 lb gw trip limit, with one sub-alternative that would reduce the trip limit to 100 lb gw when 75% of the quota is projected to be met. This alternative would result in short-term revenue reductions of approximately $194,000 annually without the sub-alternative, or from $467,000 annually (based on 2007 landings) to $228,000 (based on 2009 landings) with the sub-alternative.
4. The fourth alternative to the proposed action would establish a 1,000 lb gw trip limit, with a season starting on May 1, and reduce the trip limit to 100 lb gw when 90% of the quota is projected to be met. This alternative would result in revenue reductions greater than $102,000 annually but less than $392,000 annually. All these alternatives to the proposed action are expected to result in larger short-term revenue reductions than the proposed action.

Two alternatives, including the proposed action, were considered for commercial greater amberjack trip limit.

1. The first alternative to the proposed action is the no action alternative, which specifies a 1,000 lb gw trip limit. Under this trip limit, the commercial ACL (quota) for greater amberjack has not been fully taken. A trip limit increase has been considered to allow the fishing fleet to harvest the entire quota, thus mitigating to some extent for increased restrictions in other fisheries prosecuted by the same fishermen.
2. The second alternative consists of three sub-alternatives, one of which is the proposed action.
    a. The first sub-alternative would increase the greater amberjack commercial trip limit to 2,000 lb gw;
    b. the second sub-alternative would increase the greater amberjack commercial trip limit to 1,500 lb gw. Each of these two trip limit alternatives would result in larger short-term revenue increases than the proposed action. However, they pose a higher risk that the commercial ACL (quota) for greater amberjack would be met before the end of the fishing season, resulting in potentially larger revenue and profit reductions to the fishing fleet.

Appendix C. Regulatory Impact Review

1 Introduction

The NOAA Fisheries Service requires a Regulatory Impact Review (RIR) for all regulatory actions that are of public interest. The RIR does three things: (1) it provides a comprehensive review of the level and incidence of impacts associated with a proposed or final regulatory action; (2) it provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives that could be used to solve the problem; and, (3) it ensures that the regulatory agency systematically and comprehensively considers all available alternatives so that the public welfare can be enhanced in the most efficient and cost-effective way. The RIR also serves as the basis for determining whether the proposed regulations are a "significant regulatory action" under the criteria provided in Executive Order (E.O.) 12866 and provides information that may be used in conducting an analysis of impacts on small business entities pursuant to the Regulatory Flexibility Act (RFA). This RIR analyzes the expected impacts that this action would be expected to have on the commercial and recreational snapper grouper fisheries. Additional details on the expected economic effects of the various alternatives in this action are included in **Section 4.0** and are incorporated herein by reference.

1. Problems and Objectives

The purpose and need, issues, problems, and objectives of the proposed amendment are presented in **Sections 1.1 and 1.2** and are incorporated herein by reference. In summary, the purpose of this amendment is prevent the progressive shortening of fishing seasons for black sea bass, vermilion snapper, gag, and greater amberjack through the establishment of trip limits, split season quotas, and a spawning season closure for the black sea bass, under the current Framework Procedure for Setting Total Allowable Catch for Snapper Grouper (Framework).

2. Methodology and Framework for Analysis

This RIR assesses management measures from the standpoint of determining the resulting changes in costs and benefits to society. To the extent practicable, the net effects of the proposed measures are stated in terms of producer and consumer surplus, changes in profits, employment in the direct and support industries, and participation by charter boat fishermen and private anglers. In addition, the public and private costs associated with the process of developing and enforcing regulations on fishing for snapper grouper in waters of the U.S. South Atlantic are provided.

3. Description of the Fishery

A description of the South Atlantic snapper grouper fishery is contained in **Section 3.7** of this document.

a. Impacts of Management Measures

Details on the economic impacts of all alternatives are included in **Section 4** and are included herein by reference. The following discussion includes only the expected impacts of the preferred alternatives.

Action 1. Black Sea Bass Harvest Management Measures

The overall impacts of this action are discussed in **Section 4.1.2** of this document.

In general, a split season, like that proposed in **Alternative 3 (Preferred)** could have commercial economic benefits in that it would allow for two fishing opportunities that could extend the season, break up derby fishing, and perhaps result in higher ex-vessel prices paid to fishermen for their fish. Overall, commercial economic benefits are not able to be quantified due to a lack of cost data for specific species. Early closures during the early part of the calendar year would result in long-term economic benefits in that the spawning season would be protected. The recreational fishery would not be directly impacted by **Alternative 3 (Preferred)**.

Alternative 7 (Preferred) allows for unused portions of the commercial quota to be used during the next portion of the fishing season. This would be economically beneficial to fishermen in the short-term. However, if this results in overfishing or interruption of the rebuilding plan, then long-term economic benefits would be negative. The recreational fishery would not be directly impacted by **Alternative 7 (Preferred)**.

Relative to the current bag limit of 15-fish per person per day with ACL-based closure, **Sub-Alternative 13b (Preferred)** would be expected to have positive effects on the net operating revenues of the for-hire fleet. The economic effects of this measure on anglers would consist of increases in consumer surplus due to a shorter ACL-based closure and reductions in consumer surplus due to the reduction in fishing quality attendant with the bag limit reduction. The net economic effects on anglers would be an increase in consumer surplus assuming 2008-2009 or 2010-2011 as the base year, or a reduction in consumer surplus assuming 2009-2010 as the base year.

Action 2. Trip Limit for Vermilion Snapper

The overall impacts of this action are discussed in **Section 4.2.1** of this document.

Alternative 3 (Preferred) is estimated to result in a $306,000 annual loss in ex-vessel revenue to the commercial fishery, the lowest short-term negative economic effects compared to all other alternatives. North Carolina and Georgia and Northeast Florida are expected to experience the largest annual losses in ex-vessel revenues as a result of **Alternative 3 (Preferred)**. The losses in ex-vessel revenues as a result of **Alternative 3 (Preferred)** for each of the two regions amount to $117,000 and $176,000 for North Carolina and Georgia and Northeast Florida, respectively. However, **Alternative 3 (Preferred)** could result in a longer fishing season which could increase ex-vessel prices and ultimately result in higher profits for some fishermen, and perhaps the fishery overall. The long-term economic effects of **Alternative 3 (Preferred)** will be positive or negative depending on overall profitability of the fleet over time. We are unable to evaluate the short-term economic profitability of **Alternatives 3 (Preferred)** at this time due to lack of data and therefore the long-term economic effects are also uncertain.

Action 3. Trip Limit for Gag Grouper

The overall impacts of this action are discussed in **Section 4.3.1** of this document.

Alternative 2 (Preferred) is estimated to result in short-term negative economic effects of losses of $102,000 in ex-vessel revenue annually for the commercial fishery. However, **Alternative 2 (Preferred)** could result in a lengthened season and possibly higher ex-vessel revenues compared to **Alternative 1 (No Action)**. South Carolina and Georgia and Northeast Florida are expected to experience the greatest negative economic effects as a result of **Alternative 2 (Preferred)**. Ex-vessel revenue losses are expected to be about $48,000 annually in each of the two regions. The long-term economic effects of **Alternative 2 (Preferred)** will be positive or negative depending on overall profitability of the fleet over time. We are unable to evaluate the short-term economic profitability of **Alternative 2 (Preferred)** at this time due to lack of data and therefore the long-term economic effects are also uncertain.

Action 4. Trip Limit for Greater Amberjack

The overall impacts of this action are discussed in **Section 4.4.1** of this document.

Sub-Alternative 2c (Preferred) proposes an increase in the greater amberjack trip limit to 1,200 pounds. There are no ex-vessel revenue losses expected as a result of this alternative. In general, larger trip limits should be beneficial to commercial fishermen unless the quota is filled more quickly and the season becomes shorter. The key is the effect of larger trip limits on the length of the fishing season. We cannot determine with current logbook data how the frequency distribution of pounds per trip would change with larger trip limits, and hence do not know if larger trip limits are likely to result in shorter seasons. **Sub-Alternative 2c** is expected to result in short-term economic benefits unless the season is shortened. Actually increases in aggregate profits to the fishery are not able to be estimated because cost data is only available for the snapper grouper fishery as a whole and not for individual species.

4. Public and Private Costs of Regulations

The preparation, implementation, enforcement, and monitoring of this or any Federal action involves the expenditure of public and private resources which can be expressed as costs associated with the regulations. Costs associated with this amendment include:

Council costs of document preparation,
meetings, public hearings, and information
dissemination…………………………………………………...…….. $200,000

NOAA Fisheries administrative costs of document
preparation, meetings and review $200,000

Annual law enforcement costs...unknown

TOTAL $400,000

Law enforcement currently monitors regulatory compliance in these fisheries under routine operations and does not allocate specific budgetary outlays to these fisheries, nor are increased enforcement budgets expected to be requested to address components of this action. In practice, some enhanced enforcement activity might initially occur while the fishery becomes familiar with the new regulations. However, the costs of such enhancements cannot be forecast. Thus, no specific law enforcement costs can be identified.

a. Summary of Economic Impacts

Under the **Action 1** (Black Sea Bass Harvest Management Measures) preferred alternative, limitations placed on the amount of commercial quota that can be taken by pot gear in the black sea bass fishery also limit the amount able to be harvested through hook and line gear. Overall, some decreases in byatch mortality may occur resulting in long-term economic benefits. Under **Action 2** (Trip Limits for Vermilion Snapper) and **Action 3** (Trip Limits for Gag Grouper) preferred alternatives, establishment of trip limits are expected to result in annual losses in ex-vessel revenues. It is unknown if this will result in positive or negative long-term economic effects since the season could be lengthened and ex-vessel prices may increase. Under **Action 4** (Trip Limits for Greater Amberjack), an increase in trip limits usually result in short-term economic benefits. However, some losses are tallied under **Action 4** due to fishermen historically exceeding the current trip limit. Again, it is unknown if this will result in positive or negative long-term economic effects since the season could be lengthened and ex-vessel prices may increase.

b. Determination of Significant Regulatory Action

Pursuant to E.O. 12866, a regulation is considered a “significant regulatory action” if it is expected to result in: (1) an annual effect of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities; (2) create a serious inconsistency or otherwise interfere with an action taken or planned by another agency; (3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights or obligations of recipients thereof; or (4) raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this executive order. Based on the information provided above, this regulatory action was determined to not be economically significant for the purposes of E.O. 12866.

Appendix D. Environmental Justice Considerations

Executive Order 12898 requires federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. This executive order is generally referred to as environmental justice (EJ).

Persons employed in the snapper-grouper fishery and associated businesses and communities along the South Atlantic coast, particularly those in Georgia and north Florida, would be expected to be affected by this proposed action. Information on the race and income status for groups at the different participation levels (vessel owners, crew, dealers, processors, employees, employees of associated support industries, etc.) is not available. County level data, however, for certain communities have been assessed to examine potential EJ concerns. Because this proposed action would be expected to affect fishermen and associated industries in numerous communities along the South Atlantic coast and not just those profiled, it is possible that other counties or communities have poverty or minority rates that exceed the EJ thresholds.

In order to identify the potential for EJ concern, the rates of minority populations (non-white, including Hispanic) and the percentage of the population that was below the poverty line were examined. The threshold for comparison that was used was 1.2 times the state average such that, if the value for the community or county was greater than or equal to 1.2 times the state average, then the community or county was considered an area of potential EJ concern. Census data for the year 2000 was used Estimates of the state minority and poverty rates, associated thresholds, and community rates are provided in **Table D-1**.

Among the communities examined, based on available demographic information, only the poverty rates for Daytona Beach and St. Augustine, Florida suggest potential EJ concern. As noted above, however, additional communities beyond those profiled would be expected to be affected by the actions in this proposed amendment. Because these communities have not been profiled, the absence of additional potential EJ concerns cannot be assumed and the total number of communities that exceed the thresholds is unknown.

However, while some communities expected to be affected by this proposed amendment may have minority or economic profiles that exceed the EJ thresholds and, therefore, may constitute areas of concern, significant EJ issues are not expected to arise as a result of this proposed amendment. No adverse human health or environmental impacts are expected to accrue to this proposed amendment, nor are these measures expected to result in increased risk or exposure of affected individuals to adverse health hazards. The actions in this proposed amendment are expected to improve the ability of management to maintain the health of the respective species and biological environment in general, thereby supporting long-term economic and social benefits to users and society in general. While the proposed measures may result in some shift in harvests from some individuals, with associated reductions in income and economic and social benefits, overall, reductions to individual fishermen or business owners could be minor because all projected reductions in economic benefits may be overstated because they are the result of models that do not allow for individual behavioral changes that may be capable of mitigating potential reductions in income.

Nevertheless, some individual fishermen and shore-side workers and their families may experience adverse economic effects due to reduced harvests and/or harvest revenues. Such effects would be expected to be proportionate to participation in or dependence on the affected components of the snapper grouper fishery and not as a result of any racial, ethnic, or other criteria. The relative effect of the loss of any particular amount of income is a function of total income (the loss of $1,000 is relatively more significant to a person earning $20,000 per year than to a person earning $200,000 per year). The proposed management measures would apply to all participants in the affected area, regardless of minority status or income level, and information is not available to suggest that minorities or lower income persons are, on average, more dependent on the affected species than non-minority or higher income persons. The proposed actions for three species, black sea bass, vermilion snapper, and gag, however, by reducing harvest quantities (by restricting black sea bass harvest to hook and line gear and reducing the trip limit for vermilion snapper and gag) and extending the period when harvests can occur, may result in allowing lower income fishermen who would be most vulnerable to reductions in fishing income continue to fish. This assumption is based on an expectation that fishermen who traditionally use pots, in the case of black sea bass, or harvest higher trip limits, in the case of vermilion snapper and gag, would not be low income fishermen due to the higher operational costs and increased revenues associated with the larger harvests. Thus, by allowing continued, though reduced, harvest for a longer period, rather than allowing more efficient gear or maintaining higher limits for a longer period of time and, thereby closing the fishery sooner, the proposed actions for these species would be expected to reduce potential EJ concerns.

No EJ issues would be expected to arise with respect to the proposed black sea bass bag limit or greater amberjack commercial trip limit because both would be expected to result in an increase in revenues. Although some subsistence shore fishing may occur for black sea bass, the average annual number of black sea bass target trips for 2005-2009 from the shore for the South Atlantic was only approximately 1,400 trips, while average annual harvests were only approximately 3,500 fish, or less than three fish per target trip. As a result, the proposed bag limit would not be expected to substantially affect any potential subsistence fishing.

Finally, the general participatory process used in the development of fishery management measures is expected to provide sufficient opportunity for meaningful involvement by potentially affected individuals to participate in the development process of this amendment and have their concerns factored into the decision process.

Table D-1. Environmental Justice Thresholds (2000 U.S. Census data).

State	Community	Minority Rate	Minority Threshold*	Poverty Rate	Poverty Threshold*
Florida		34.60	41.52	12.50	15.00
	Cape Canaveral	8.10		11.60	
	Daytona Beach	39.7		23.6	
	Fernandina Beach	20.0		10.2	
	Jacksonville Beach	11.0		7.2	
	St. Augustine	20.7		15.8	
Georgia		37.40	44.88	13.00	15.60
	Townsend**	39.10		14.60	
South Carolina		33.90	40.68	14.10	16.92
	Little River	9.10		7.50	
North Carolina		29.80	35.76	12.30	14.76
	Atlantic City	2.60		7.30	
	Beaufort	25.40		16.60	
	Hatteras Village	6.60		10.00	
	Morehead City	19.20		14.60	
	Sneads Ferry	9.70		13.50	
	Wanchese	3.30		8.10	

*Calculated as 1.2 times the state rate.

**Values are for entire McIntosh County.

Appendix E. Glossary

Acceptable Biological Catch (ABC): Maximum amount of fish stock than can be harvested without adversely affecting recruitment of other components of the stock. The ABC level is typically higher than the total allowable catch, leaving a buffer between the two.

ALS: Accumulative Landings System. NMFS database which contains commercial landings reported by dealers.

Biomass: Amount or mass of some organism, such as fish.

B_{MSY}: Biomass of population achieved in long-term by fishing at F_{MSY}.

Bycatch: Fish harvested in a fishery, but not sold or kept for personal use. Bycatch includes economic discards and regulatory discards, but not fish released alive under a recreational catch and release fishery management program.

Caribbean Fishery Management Council (CFMC): One of eight regional councils mandated in the Magnuson-Stevens Fishery Conservation and Management Act to develop management plans for fisheries in federal waters. The CFMC develops fishery management plans for fisheries off the coast of the U.S. Virgin Islands and the Commonwealth of Puerto Rico.

Catch Per Unit Effort (CPUE): The amount of fish captured with an amount of effort. CPUE can be expressed as weight of fish captured per fishing trip, per hour spent at sea, or through other standardized measures.

Charter Boat: A fishing boat available for hire by recreational anglers, normally by a group of anglers for a short time period.

Cohort: Fish born in a given year. (See year class.)

Control Date: Date established for defining the pool of potential participants in a given management program. Control dates can establish a range of years during which a potential participant must have been active in a fishery to qualify for a quota share.

Constant Catch Rebuilding Strategy: A rebuilding strategy where the allowable biological catch of an overfished species is held constant until stock biomass reaches B_{MSY} at the end of the rebuilding period.

Constant F Rebuilding Strategy: A rebuilding strategy where the fishing mortality of an overfished species is held constant until stock biomass reached BMSY at the end of the rebuilding period.

Directed Fishery: Fishing directed at a certain species or species group.

Discards: Fish captured, but released at sea.

Discard Mortality Rate: The percent of total fish discarded that do not survive being captured and released at sea.

Derby: Fishery in which the TAC is fixed and participants in the fishery do not have individual quotas. The fishery is closed once the TAC is reached, and participants attempt to maximize their harvests as quickly as possible. Derby fisheries can result in capital stuffing and a race for fish.

Effort: The amount of time and fishing power (i.e., gear size, boat size, horsepower) used to harvest fish.

Exclusive Economic Zone (EEZ): Zone extending from the shoreline out to 200 nautical miles in which the country owning the shoreline has the exclusive right to conduct certain activities such as fishing. In the United States, the EEZ is split into state waters (typically from the shoreline out to 3 nautical miles) and federal waters (typically from 3 to 200 nautical miles).

Exploitation Rate: Amount of fish harvested from a stock relative to the size of the stock, often expressed as a percentage.

F: Fishing mortality.

Fecundity: A measurement of the egg-producing ability of fish at certain sizes and ages.

Fishery Dependent Data: Fishery data collected and reported by fishermen and dealers.

Fishery Independent Data: Fishery data collected and reported by scientists who catch the fish themselves.

Fishery Management Plan: Management plan for fisheries operating in the federal produced by regional fishery management councils and submitted to the Secretary of Commerce for approval.

Fishing Effort: Usually refers to the amount of fishing. May refer to the number of fishing vessels, amount of fishing gear (nets, traps, hooks), or total amount of time vessels and gear are actively engaged in fishing.

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

Fishing Power: Measure of the relative ability of a fishing vessel, its gear, and its crew to catch fishes, in reference to some standard vessel, given both vessels are under identical conditions.

$F_{30\%SPR}$: Fishing mortality that will produce a static SPR = 30%.

$F_{45\%SPR}$: Fishing mortality that will produce a static SPR = 45%.

F_{OY}: Fishing mortality that will produce OY under equilibrium conditions and a corresponding biomass of B_{OY}. Usually expressed as the yield at 85% of F_{MSY}, yield at 75% of F_{MSY}, or yield at 65% of F_{MSY}.

F_{MSY}: Fishing mortality that if applied constantly, would achieve MSY under equilibrium conditions and a corresponding biomass of B_{MSY}

Fork Length (FL): The length of a fish as measured from the tip of its snout to the fork in its tail.

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

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

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

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

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

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

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

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

Marine Recreational Fisheries Statistics Survey (MRFSS): Survey operated by NMFS in cooperation with states that collects marine recreational data.

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

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

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

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

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

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

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

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

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

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

Overfishing: Overfishing occurs when a stock or stock complex is subjected to a rate of fishing mortality that exceeds the maximum fishing mortality threshold (e.g., current fishing mortality rate > MFMT = overfishing).

Quota: Percent or annual amount of fish that can be harvested.

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

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

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

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

South Atlantic Fisheries Management Council (SAFMC): One of eight regional councils mandated in the Magnuson-Stevens Fishery Conservation and Management Act to develop management plans for fisheries in federal waters. The SAFMC develops fishery management plans for fisheries off North Carolina, South Carolina, Georgia, and the east coast of Florida.

Spawning Potential Ratio (Transitional SPR): Formerly used in overfished definition. The number of eggs that could be produced by an average recruit in a fished stock divided by the number of eggs that could be produced by an average recruit in an unfished stock. SPR can also be expressed as the spawning stock biomass per recruit (SSBR) of a fished stock divided by the SSBR of the stock before it was fished.

% Spawning Per Recruit (Static SPR): Formerly used in overfishing determination. The maximum spawning per recruit produced in a fished stock divided by the maximum spawning per recruit, which occurs under the conditions of no fishing. Commonly abbreviated as %SPR.

Spawning Stock Biomass (SSB): The total weight of those fish in a stock which are old enough to spawn.

Spawning Stock Biomass Per Recruit (SSBR): The spawning stock biomass divided by the number of recruits to the stock or how much spawning biomass an average recruit would be expected to produce.

Total Allowable Catch (TAC): The total amount of fish to be taken annually from a stock or stock complex. This may be a portion of the Allowable Biological Catch (ABC) that takes into consideration factors such as bycatch.

Total Length (TL): The length of a fish as measured from the tip of the snout to the tip of the tail.

Appendix F. Other Applicable Law

1. Other Applicable Law

1.1. Administrative Procedure Act

All federal rulemaking is governed under the provisions of the Administrative Procedure Act (APA) (5 U.S.C. Subchapter II), which establishes a "notice and comment" procedure to enable public participation in the rulemaking process. Under the APA, NOAA Fisheries Service is required to publish notification of proposed rules in the Federal Register and to solicit, consider, and respond to public comment on those rules before they are finalized. The APA also establishes a 30-day waiting period from the time a final rule is published until it takes effect. The Council has not chosen to implement any measures in Regulatory Amendment 9 that require a delayed or expedited effective date.

1.2. Coastal Zone Management Act

Section 307(c)(1) of the federal Coastal Zone Management Act (CZMA) of 1972 requires that all federal activities that directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. While it is the goal of the Council to have management measures that complement those of the states, federal and state administrative procedures vary and regulatory changes are unlikely to be fully instituted at the same time. Based on the analysis of the environmental consequences of the proposed action in Section 4.0, the Council has concluded this amendment would improve federal management of snapper grouper species.

1.3. Endangered Species Act

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

Snapper Grouper Fishery
On June 7, 2006, a formal consultation and associated biological opinion on the continued authorization of the South Atlantic snapper-grouper fishery on sea turtles and smalltooth sawfish was completed. The opinion concluded the continued authorization of the fishery would not affect ESA-listed marine mammals and is not likely to jeopardize the continued existence of any other ESA-listed species. An incidental take statement authorizing a limited number of sea turtle and smalltooth sawfish incidental captures was issued for the fishery. Subsequent to the 2006 biological opinion, two species of coral (*Acropora cervicorni*s and *Acropora palmata*) were listed as threatened and critical habitat for these species was designated. In a consultation memorandum dated July 9, 2007, NOAA Fisheries Service concluded the continued authorization of the South Atlantic snapper-grouper fishery, is not likely to adversely affect these *Acropora* species. In a consultation memorandum dated December 2, 2008, NOAA Fisheries Service concluded the continued authorization of the snapper-grouper fishery is not likely to adversely affect designated *Acropora* critical habitat.

1.4. Executive Order 12612: Federalism

E.O. 12612 requires agencies to be guided by the fundamental federalism principles when formulating and implementing policies that have federalism implications. The purpose of the Order is to guarantee the division of governmental responsibilities between the federal government and the states, as intended by the framers of the Constitution. No federalism issues have been identified relative to the actions proposed in this amendment and associated regulations. The affected states have been closely involved in developing the proposed management measures and the principal state officials responsible for fisheries management in their respective states have not expressed federalism related opposition to the proposed action.

1.5 Executive Order 12866: Regulatory Planning and Review

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

1.6 Executive Order 12898: Environmental Justice

See **Appendix D** for Environmental Justice considerations as they relate to Regulatory Amendment 9.

1.7 Executive Order 12962: Recreational Fisheries

E.O. 12962 requires federal agencies, in cooperation with states and tribes, to improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities through a variety of methods including, but not limited to, developing joint partnerships; promoting the restoration of recreational fishing areas that are limited by water quality and habitat degradation; fostering sound aquatic conservation and restoration endeavors; and evaluating the effects of federally funded, permitted, or authorized actions on aquatic systems and recreational fisheries, and documenting those effects. Additionally, the order establishes a seven member National Recreational Fisheries Coordination Council responsible for, among other things, ensuring that social and economic values of healthy aquatic systems that support recreational fisheries are considered by federal agencies in the course of their actions, sharing the latest resource information and management technologies, and reducing duplicative and cost-inefficient programs among Federal agencies involved in conserving or managing recreational fisheries. The Council also is responsible for developing, in cooperation with federal agencies, states and tribes, a Recreational Fishery Resource Conservation Plan - to include a five-year agenda.

1.8 Marine Mammal Protection Act

The Marine Mammal Protection Act (MMPA) established a moratorium, with certain exceptions, on the taking of marine mammals in U.S. waters and by U.S. citizens on the high seas. It also prohibits the importing of marine mammals and marine mammal products into the United States. Under the MMPA, the Secretary of Commerce (authority delegated to NOAA Fisheries Service) is responsible for the conservation and management of cetaceans and pinnipeds (other than walruses). The Secretary of the Interior is responsible for walruses, sea otters, polar bears, manatees, and dugongs.

In 1994, Congress amended the MMPA, to govern the taking of marine mammals incidental to commercial fishing operations. This amendment required the preparation of stock assessments for all marine mammal stocks in waters under U.S. jurisdiction; development and implementation of take-reduction plans for stocks that may be reduced or are being maintained below their optimum sustainable population levels due to interactions with commercial fisheries; and studies of pinniped-fishery interactions. The MMPA requires a commercial fishery to be placed in one of three categories, based on the relative frequency of incidental serious injuries and mortalities of marine mammals. Category I designates fisheries with frequent serious injuries and mortalities incidental to commercial fishing; Category II designates fisheries with occasional serious injuries and mortalities; and Category III designates fisheries with a remote likelihood or no known serious injuries or mortalities. To legally fish in a Category I and/or II fishery, a fisherman must obtain a marine mammal authorization certificate by registering with the Marine Mammal Authorization Program (50 CFR 229.4), they must accommodate an observer if requested (50 CFR 229.7(c)) and comply with any applicable take reduction plans.

The commercial hook-and-line components of the South Atlantic snapper grouper fishery (i.e., bottom longline, bandit gear, and handline) are listed as part of a Category III fishery (75 FR 68468, November 8, 2010) because there have been no documented interactions between these gears and marine mammals. The black sea bass pot component of the South Atlantic snapper grouper fishery is part of the Atlantic mixed species trap/pot fishery, a Category II fishery, in the 2011 LOF (75 FR 68468, November 8, 2010). The Atlantic mixed species trap/pot fishery designation was created in 2003 (68 FR 41725, July 15, 2003), by combining several separately listed trap/pot fisheries into a single group. This group was designated Category II as a precaution because of known interactions between marine mammals and gears similar to those included in this group. Prior to this consolidation, the black sea bass pot fishery in the South Atlantic was a part of the "U.S. Mid-Atlantic and Southeast U.S. Atlantic Black Sea Bass Trap/Pot" fishery (Category III). There has never been a documented interaction between marine mammals and black sea bass trap/pot gear in the South Atlantic. The actions in Regulatory Amendment 9 are not expected to negatively impact the provisions of the MMPA.

Appendix G. Bycatch Practicability Analysis

1. Population Effects for Bycatch Species

Background

Regulatory Amendment 9 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Regulatory Amendment 9) includes actions which could: establish trip limits for vermilion snapper and gag; reduce the black sea bass bag limit; establish a split season quota for black sea bass; and modify the current trip limit for greater amberjack. Regulatory Amendment 9 also includes alternatives for trip limits, a change in the fishing year, and a spawning season closure for the black sea bass component of the snapper grouper fishery.

Black sea bass are predominantly taken with pots; whereas, hook and line gear has been the predominant gear type used to capture greater amberjack, gag, and vermilion snapper (**Table G-1**).

Table G-1. Percentage of commercial catch by gear based on data from 2005-2009.

Taxon	H&L	Longline	Spear	Pots
Greater Amberjack	93%	0%	7%	0%
Gag	82%	0%	18%	0%
Black Sea Bass	11%	0%	0%	89%
Vermilion Snapper	100%	0%	0%	0%

Source: NMFS SEFSC Logbook Program.

During 2005-2009, the recreational sector dominated landings of black sea bass and greater amberjack; whereas, landings of vermilion snapper were dominated by the commercial sector. Landings of gag were fairly evenly divided between the commercial and recreational sector during 2005-2009 (**Table G-2**).

Table G-2. Percentage of landings among the commercial, for-hire, private recreational sectors during 2005-2009. Landings provided by the Southeast Fisheries Science Center.

Taxon	Commercial	For Hire	Recreational
black sea bass	42%	20%	38%
gag	54%	14%	32%
greater amberjack and unc jacks	41%	34%	25%
vermilion snapper	63%	30%	7%

*Commercial represents unclassified triggerfish.
**Commercial triggerfish landings are not identified to species; however, most triggerfish in landings are likely gray triggerfish.

Commercial Fishery

During 2005 to 2009, approximately 20% of snapper grouper permitted vessels from the Gulf of Mexico and South Atlantic were randomly selected to fill out supplementary logbooks. The average number of trips per year during 2005 to 2009 was 13,973 (**Table G-3**). Fishermen spent an average of 1.69 days at sea per trip.

Table G-3. Snapper grouper fishery effort for South Atlantic.

YEAR	Trips	Days	Days per Trip
2005	13,771	22,855	1.66
2006	13,264	23,324	1.76
2007	14,885	24,509	1.65
2008	14,781	25,023	1.69
2009	15,345	25,487	1.66
Mean	13,973	23,563	1.69

Source: NMFS SEFSC Logbook Program.

For species in snapper grouper fishery management unit (FMU), the number of commercial trips that reported discards was greatest for yellowtail snapper, red porgy, vermilion snapper, scamp, and black sea bass (**Table G-4**). **Table G-4** indicates many other species not included in the snapper grouper FMU including mackerel species, sharks, dolphin, and others are discarded by fishermen with federal commercial snapper grouper permits.

Table G-4. The 70 most commonly discarded species during 2005-2009 for the South Atlantic. Snapper grouper species are shaded in gray. Note: Represents total of unexpanded data during 2005-2009.

Species	Number of trips reported discarding the species	Number discarded
red porgy, unc	1,449	128,197
vermilion snapper	1,272	89,156
black sea bass, unc	896	69,027
knobbed porgy	503	27,924
yellowtail snapper	2,058	21,420
rough skin dogfish	85	14,807
red snapper	634	11,340
scamp	969	8,703
king mackerel	1,415	7,917
mangrove snapper	416	7,230
spottail pinfish	113	7,194
smooth dogfish	43	5,456
Atlantic sharpnose	204	5,055
menhaden	50	4,880
little tunny	140	4,189
greater amberjack	361	4,163
gag	618	4,045
grunts	181	3,517

Species	Number of trips reported discarding the species	Number discarded
dogfish shark	54	3,435
bluefish	77	3,092
red grouper	559	3,045
white grunt	168	2,695
gray triggerfish	233	2,508
scups or porgies, unc	73	2,495
blue runner	303	2,332
triggerfish	168	2,274
blacktip shark	161	2,098
amberjack	262	1,818
sandbar shark	129	1,810
black grouper	381	1,723
tomtate	22	1,703
tiger shark	115	1,506
mutton snapper	296	1,347
dolphin	214	1,270
unc, finfish for food	86	1,167
Atlantic bonito	218	1,049
speckled hind	122	817
remora	270	815
snappers, unc	36	681
barracuda	75	668
Spanish mackerel	106	651
ballyhoo	18	600
lane snapper	73	582
groupers	67	396
chubs	8	364
caribbean sharpnose	13	361
stingrays	29	335
hake	35	333
rays, unc	46	324
snowy grouper	59	319
margate	17	313
cobia	182	304
needlefish	72	299
cero	98	288
lesser amberjack	12	282
sand tilefish	35	264
spinner shark	33	245
hammerhead shark	69	218

Species	Number of trips reported discarding the species	Number discarded
almaco jack	20	203
sheepshead	21	201
sea catfish	69	188
rudderfish	33	181
black margate	3	161
yellowfin tuna	36	161
banded rudderfish	14	159
mahogany snapper	13	133
rock sea bass	11	131
squirrelfish	18	131
silky shark	13	114
Atlantic spadefish	21	107

Recreational Fishery

For the recreational fishery, estimates of the number of recreational discards are available from MRFSS and the NMFS headboat survey. The MRFSS system classifies recreational catch into three categories:

- Type A - Fishes that were caught, landed whole and available for identification and enumeration by the interviewers.
- Type B - Fishes that were caught but were either not kept or not available for identification:
    - Type B1 - Fishes that were caught and filleted, released dead, given away, or disposed of in some way other than Types A or B2.
    - Type B2 - Fishes that were caught and released alive.

For species in the Regulatory Amendment 9, the number of released fish was greatest for black sea bass, followed by vermilion snapper (**Table G-5**).

Table G-5. Estimated number of fish released (B2) fish in numbers for the South Atlantic during 2005-2009. Species in Regulatory Amendment 9 are shaded in gray.

Species	Year: 2005		Year: 2006		Year: 2007		Year: 2008		Year: 2009	
	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE
BARRACUDAS										
BARRACUDAS	126,721	10.8	180,157	8.7	268,282	9.5	239,534	9.6	204,545	9.8
-- Species Group Subtotal --	126,721	10.8	180,157	8.7	268,282	9.5	239,534	9.6	204,545	9.8
BLUEFISH										
BLUEFISH	3,004,781	6.1	3,707,415	5.7	4,539,620	6	3,440,594	5	2,337,256	5.4
-- Species Group Subtotal --	3,004,781	6.1	3,707,415	5.7	4,539,620	6	3,440,594	5	2,337,256	5.4
CARTILAGINOUS FISHES										
DOGFISH SHARKS	151,502	28.1	91,248	17.4	132,366	42.2	129,161	22.3	92,811	24.9
OTHER SHARKS	2,888,895	5.1	2,770,853	6.8	3,128,079	4.5	2,925,490	4.4	2,638,748	5.5
SKATES/RAYS	1,387,330	6.9	1,059,210	6.7	1,183,040	5.3	1,070,743	6.2	1,431,617	10.8
-- Species Group Subtotal --	4,427,727	4.1	3,921,311	5.1	4,443,485	3.7	4,125,394	3.6	4,163,176	5.1
CATFISHES										
FRESHWATER CATFISHES	64,895	28.1	40,805	30.2	20,552	25.6	45,502	28	12,530	35.4
SALTWATER CATFISHES	1,775,623	6.2	1,362,776	5.8	2,473,885	7.1	1,912,040	6.5	1,016,001	6.6
-- Species Group Subtotal --	1,840,518	6	1,403,581	5.7	2,494,437	7	1,957,542	6.3	1,028,531	6.6
CODS AND HAKES										
OTHER CODS/HAKES	34,531	40.3	5,889	37	9,605	31	7,405	69.3	32,350	39.9
-- Species Group Subtotal --	34,531	40.3	5,889	37	9,605	31	7,405	69.3	32,350	39.9
DOLPHINS										
DOLPHINS	218,931	16.1	231,853	10.8	254,568	17.1	200,879	11.8	75,493	14
-- Species Group Subtotal --	218,931	16.1	231,853	10.8	254,568	17.1	200,879	11.8	75,493	14
DRUMS										
ATLANTIC CROAKER	2,153,037	6.6	3,439,549	6.4	2,540,696	7	2,372,758	5.9	3,113,213	5.5
BLACK DRUM	190,110	11.4	312,415	9.7	820,032	10.2	640,413	7.7	293,214	8.8
KINGFISHES	2,226,960	6.8	3,582,622	7.7	3,309,945	5.9	2,902,539	6.1	2,710,822	6.8
OTHER DRUM	581,461	11	834,383	8.8	1,049,974	10.9	1,173,266	9.5	900,754	12.3
RED DRUM	2,412,470	5.8	2,111,089	5.6	2,070,575	5.6	2,333,096	6.1	1,979,705	5.6
SAND SEATROUT	0	0	9,401	72	11,324	45.8	27,367	42.5	110,534	48.4
SILVER PERCH	480,503	13.2	726,915	11.5	584,828	12.1	491,659	15.6	595,518	15.6
SPOT	1,728,002	9.9	3,851,795	9.6	1,732,440	9.9	1,713,571	7.6	1,798,841	8.8

Species	Year: 2005		Year: 2006		Year: 2007		Year: 2008		Year: 2009	
	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE
SPOTTED SEATROUT	5,336,913	5.3	4,988,541	4.7	6,114,718	5	4,715,679	5.5	3,782,693	5.4
WEAKFISH	438,519	11	538,799	11.4	346,898	14	265,383	14.1	189,614	21.8
-- Species Group Subtotal --	15,547,975	2.8	20,395,509	2.9	18,581,430	2.6	16,635,731	2.5	15,474,908	2.7
EELS										
EELS	51,553	26.3	62,029	25.8	43,847	16.3	41,653	19	27,700	17.3
-- Species Group Subtotal --	51,553	26.3	62,029	25.8	43,847	16.3	41,653	19	27,700	17.3
FLOUNDERS										
GULF FLOUNDER	4,932	64	10,047	58.5	32,472	49.1	6,181	51.8	964	100
OTHER FLOUNDERS	1,214,700	6.3	1,201,665	5.6	1,689,592	5.8	1,900,658	5.9	1,577,521	6.8
SOUTHERN FLOUNDER	131,274	17.9	257,712	13.7	190,340	13	125,290	14.8	104,871	23.9
SUMMER FLOUNDER	83,320	22.4	139,805	20.5	10,815	38.6	5,715	38	35,632	27.3
-- Species Group Subtotal --	1,434,226	5.7	1,609,229	5	1,923,219	5.4	2,037,844	5.6	1,718,988	6.4
GRUNTS										
OTHER GRUNTS	905,462	8.2	790,470	8.4	1,561,407	8.3	903,581	7.7	1,219,001	8.5
PIGFISH	743,829	7.8	553,384	9.6	868,092	10.3	821,930	8.4	841,230	10.1
WHITE GRUNT	195,770	14.8	274,926	15	241,875	11.3	434,040	14.5	148,501	24.3
-- Species Group Subtotal --	1,845,061	5.3	1,618,780	5.8	2,671,374	6	2,159,551	5.4	2,208,732	6.3
HERRINGS										
HERRINGS	1,243,180	17.4	2,640,817	12.5	1,203,718	16.9	512,502	31.7	1,698,306	15.3
-- Species Group Subtotal --	1,243,180	17.4	2,640,817	12.5	1,203,718	16.9	512,502	31.7	1,698,306	15.3
JACKS										
BLUE RUNNER	661,888	9.6	822,370	9.2	1,159,991	11.7	796,058	11.1	705,910	24.5
CREVALLE JACK	1,362,086	6.7	1,264,018	6.5	1,634,661	6	1,097,877	7	1,139,832	7.9
FLORIDA POMPANO	693,755	12.5	1,007,541	20.1	605,621	12	696,269	10.7	345,791	21.5
GREATER AMBERJACK	16,687	25.1	19,234	19.6	30,752	20.8	80,931	19.8	71,802	16.1
OTHER JACKS	332,217	17.4	180,298	14	326,798	15.8	433,050	12.2	352,874	16
-- Species Group Subtotal --	3,066,633	5	3,293,461	7.1	3,757,823	5.1	3,104,185	4.8	2,616,209	8.3
MULLETS										
MULLETS	1,384,536	13.7	1,801,720	11.3	2,263,848	9.4	1,091,237	10.7	1,367,241	11.1
-- Species Group Subtotal --	1,384,536	13.7	1,801,720	11.3	2,263,848	9.4	1,091,237	10.7	1,367,241	11.1
OTHER FISHES										

Species	Year: 2005		Year: 2006		Year: 2007		Year: 2008		Year: 2009	
	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE
OTHER FISHES	2,965,704	4.8	2,882,611	4.7	4,518,284	3.7	2,828,534	4.2	2,751,240	5.7
-- Species Group Subtotal --	2,965,704	4.8	2,882,611	4.7	4,518,284	3.7	2,828,534	4.2	2,751,240	5.7
PORGIES										
OTHER PORGIES	72,379	20.1	150,357	20.4	139,040	21.4	116,266	19.5	65,856	19.2
PINFISHES	3,917,568	5.8	5,056,606	6.2	4,960,818	5.1	5,040,941	6	3,588,516	5.8
RED PORGY	27,514	19.2	16,636	15.8	30,085	19	44,154	30	18,089	55.8
SCUP	1,620	46.5	7,721	44	5,729	30.6	9,755	36	3,293	25.3
SHEEPSHEAD	436,207	9.6	437,836	9.3	603,767	10.7	773,720	8	520,600	9.1
-- Species Group Subtotal --	4,455,288	5.2	5,669,156	5.6	5,739,439	4.5	5,984,836	5.2	4,196,354	5.1
PUFFERS										
PUFFERS	425,264	7.7	635,341	8.5	1,152,418	6.6	1,341,422	6.7	912,983	7.6
-- Species Group Subtotal --	425,264	7.7	635,341	8.5	1,152,418	6.6	1,341,422	6.7	912,983	7.6
SEA BASSES										
BLACK SEA BASS	2,483,947	5.5	2,967,099	5.6	3,764,105	7.3	2,940,795	6.2	2,716,240	6.2
EPINEPHELUS GROUPERS	254,936	9.1	165,261	9.1	107,240	17.6	97,808	11.9	128,065	11.9
MYCTEROPERCA GROUPERS	145,222	11	152,123	10.7	302,398	11.2	252,309	8.9	142,865	10.6
OTHER SEA BASSES	324,893	11.5	797,375	11.3	910,942	8.7	801,710	9.1	499,275	10.4
-- Species Group Subtotal --	3,208,998	4.5	4,081,858	4.6	5,084,685	5.7	4,092,622	4.8	3,486,445	5.1
SEAROBINS										
SEAROBINS	158,366	12.1	300,921	21.5	432,617	11.1	333,166	14.5	123,415	10.5
-- Species Group Subtotal --	158,366	12.1	300,921	21.5	432,617	11.1	333,166	14.5	123,415	10.5
SNAPPERS										
GRAY SNAPPER	1,228,211	7.8	1,457,251	5.9	2,936,755	6	1,839,406	6.5	1,725,889	7.4
LANE SNAPPER	111,276	22.7	137,572	16.8	330,770	14.1	227,775	18.4	157,594	16.6
OTHER SNAPPERS	242,324	10.6	280,948	10.1	426,284	10.4	557,020	10	314,681	10.1
RED SNAPPER	125,739	13.3	134,692	18.5	455,405	12.8	403,244	10.5	210,279	12.4
VERMILION SNAPPER	140,356	13.2	102,219	34.3	293,433	12.9	246,103	14.2	226,125	11.6
YELLOWTAIL SNAPPER	258,606	17.7	344,982	11.7	402,201	12.5	319,239	11.1	221,836	22.6
-- Species Group Subtotal --	2,106,512	5.5	2,457,664	4.5	4,844,848	4.3	3,592,787	4.3	2,856,404	5.2
TEMPERATE BASSES										
STRIPED BASS	136,536	16.3	85,438	19.4	50,735	18.2	86,858	19.6	93,353	21
WHITE PERCH	0	0	46,904	38.1	7,339	56.8	1,397	58.5	0	0

Species	Year: 2005		Year: 2006		Year: 2007		Year: 2008		Year: 2009	
	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE
-- Species Group Subtotal --	136,536	16.3	132,342	18.4	58,074	17.5	88,255	19.4	93,353	21
TOADFISHES										
TOADFISHES	477,955	8.3	479,125	9.4	435,924	7.7	691,142	8	405,848	8.2
-- Species Group Subtotal --	477,955	8.3	479,125	9.4	435,924	7.7	691,142	8	405,848	8.2
TRIGGERFISHES/FILEFISHES										
TRIGGERFISHES/FILEFISHES	239,995	10.7	210,123	14.6	228,262	10.1	199,476	10.7	181,503	14
-- Species Group Subtotal --	239,995	10.7	210,123	14.6	228,262	10.1	199,476	10.7	181,503	14
TUNAS AND MACKERELS										
ATLANTIC MACKEREL	67,658	81.9								
KING MACKEREL	207,618	13.7	195,618	9.8	303,008	9.4	166,716	9.7	127,316	13.4
LITTLE TUNNY/ATLANTIC BONITO	288,459	8.5	476,296	7	780,193	8.4	511,878	7.6	585,015	8.3
OTHER TUNAS/MACKERELS	66,422	24.6	43,933	13.7	58,912	16.3	121,352	17.4	93,887	17
SPANISH MACKEREL	704,569	12.9	321,860	11.9	586,722	9.4	994,693	10.4	466,681	9.4
-- Species Group Subtotal --	1,334,726	8.5	1,037,707	5.3	1,728,835	5.3	1,794,639	6.3	1,272,899	5.4
WRASSES										
OTHER WRASSES	2,966	53.3	2,079	50.4	10,386	41.8	13,203	51.5	2,977	42.4
TAUTOG	2,885	100	5,185	52	2,905	60.9	1,755	58.9	1,922	62.6
-- Species Group Subtotal --	5,851	56.2	7,264	39.8	13,291	35.3	14,958	46	4,899	35.6
-- Grand Total --	49,741,568	1.4	58,765,863	1.6	66,691,933	1.3	56,515,888	1.3	49,238,778	1.5

Source: MRFSS Web Site http://www.st.nmfs.noaa.gov/st1/recreational/overview/overview.html.

For species in the Regulatory Amendment 9, black sea bass and vermilion snapper were most often discarded by headboat fishermen during 2005-2009 (**Table G-6**).

Table G-6. Most commonly discarded species from headboats in South Atlantic. Total fish reported released alive or dead on sampled headboat trips during 2005-2009. Data are not expanded to all trips. Species in Comprehensive ACL Amendment are shaded in gray.

Species	# trips reporting discards	released	sum
black sea bass	17,087	rel_dead	18,316
		rel_live	721,640
vermilion snapper	11,601	rel_dead	19,013
		rel_live	413,854
tomtate	7,801	rel_dead	34,943
		rel_live	243,869
red snapper	9,198	rel_dead	3,214
		rel_live	212,572
red porgy	3,848	rel_dead	2,400
		rel_live	110,940
yellowtail snapper	11,797	rel_dead	3,005
		rel_live	103,625
white grunt	12,917	rel_dead	3,154
		rel_live	91,647
pinfish	3,000	rel_dead	2,850
		rel_live	81,423
sharpnose shark	10,928	rel_dead	477
		rel_live	82,816
spottail pinfish	3,450	rel_dead	199
		rel_live	35,381
red grouper	7,885	rel_dead	317
		rel_live	27,527
gag	9,520	rel_dead	339
		rel_live	20,393
gray triggerfish	14,291	rel_dead	380
		rel_live	18,599
lane snapper	7,506	rel_dead	591
		rel_live	17,561
scamp	4,809	rel_dead	275
		rel_live	16,123
bank sea bass	2,903	rel_dead	763
		rel_live	13,725
gray snapper	10,376	rel_dead	137
		rel_live	13,744
mutton snapper	8,907	rel_dead	513

Species	# trips reporting discards	released	sum
		rel_live	13,030
squirrelfish	3,012	rel_dead	155
		rel_live	9,688
bluerunner	3,958	rel_dead	298
		rel_live	8,439
scup	1,187	rel_dead	865
		rel_live	7,402
greater amberjack	4,438	rel_dead	104
		rel_live	8,155
smooth dogfish	865	rel_dead	31
		rel_live	6,830
little tunny	4,019	rel_dead	219
		rel_live	6,620
king mackerel	10,764	rel_dead	232
		rel_live	5,913
banded rudderfish	2,333	rel_dead	31
		rel_live	5,426
inshore lizardfish	1,126	rel_dead	53
		rel_live	4,804
spanish mackerel	2,117	rel_dead	154
		rel_live	4,380
remora	1,408	rel_dead	65
		rel_live	4,139
bluefish	1,420	rel_dead	412
		rel_live	3,728
bluestriped grunt	2,283	rel_dead	173
		rel_live	3,650
blacktip shark	1,001	rel_dead	18
		rel_live	3,729
porkfish	1,645	rel_dead	67
		rel_live	3,429
black grouper	2,530	rel_dead	49
		rel_live	3,026
nurse shark	1,730	rel_dead	64
		rel_live	2,964
graysby	2,736	rel_dead	213
		rel_live	2,699
cobia	3,925	rel_dead	17
		rel_live	2,771
sand perch	1,017	rel_dead	195
		rel_live	2,279

Species	# trips reporting discards	released	sum
rock hind	1,998	rel_dead	290
		rel_live	1,663
doctorfish	873	rel_dead	60
		rel_live	1,790
almaco jack	2,652	rel_dead	24
		rel_live	1,768
sandbar shark	393	rel_dead	1
		rel_live	1,694
margate	744	rel_dead	75
		rel_live	1,540
dolphin	3,087	rel_dead	45
		rel_live	1,370
bigeye	2,098	rel_dead	39
		rel_live	1,231
whitebone porgy	4,480	rel_dead	32
		rel_live	1,204
spiny dogfish	58	rel_dead	0
		rel_live	1,201
jolthead porgy	3,667	rel_dead	80
		rel_live	1,054
great barracuda	2,085	rel_dead	47
		rel_live	1,079
pigfish	1,072	rel_dead	11
		rel_live	996
rainbow runner	669	rel_dead	55
		rel_live	811
sand tilefish	872	rel_dead	40
		rel_live	823
atlantic croaker	39	rel_dead	0
		rel_live	843
knobbed porgy	3,890	rel_dead	26
		rel_live	554
crevalle jack	265	rel_dead	0
		rel_live	564

Source: NMFS Headboat survey.

Finfish Bycatch Mortality

Release mortality rates are unknown for most snapper grouper species. Recent SEDAR assessments include estimates of release mortality rates based on published studies. Stock assessment reports can be found at http://www.sefsc.noaa.gov/sedar/.

SEDAR 17 (2008) recommended a release mortality rate for vermilion snapper of 38% for both the commercial and recreational fisheries. SEDAR 10 (2006) estimated release mortality rates of 40% and 25% for gag taken by commercial and recreational fishermen, respectively. SEDAR 15 (2008) estimated a 20% release mortality rate for greater amberjack. Release mortality of black sea bass is considered to be low (15%) (SEDAR 2-SAR 3 2005) indicating minimum size limits are probably an effective management tool for black sea bass. Collins *et al*. (1999) reported venting of the swim bladder yielded reductions in release mortality of black sea bass, and the benefits of venting increased with capture depth. The same study was analyzed by Wilde (2009) to suggest that venting increased the survival of black sea bass, although this was an exception to the general findings of Wilde's (2009) study.

Practicability of Management Measures in Directed Fisheries Relative to their Impact on Bycatch and Bycatch Mortality

Tables G-2 through G-6 list the species that are most commonly discarded by commercial and recreational fishermen. The purpose of Regulatory Amendment 9 is to prevent the progressive shortening of fishing seasons for black sea bass, vermilion snapper, and gag, and maximize the probability of reaching optimum yield for greater amberjack. This would be accomplished through: the establishment of trip limits for black sea bass, vermilion snapper, and gag; split season quotas, a spawning season closure for black sea bass; a reduction in the black sea bass bag limit, and modifying the current trip limit for greater amberjack under the Framework Procedure for Setting Total Allowable Catch for Snapper Grouper. Currently, a derby fishery exists in the commercial sector for vermilion snapper and black sea bass. Large numbers of these species are likely being discarded as fishermen target co-occurring species. A potential for a derby fishery exists for gag. Establishment of trip limits for vermilion snapper and gag, as well as a split season quota for black sea bass has the potential to extend fishing seasons and reduce unnecessary bycatch of these and other co-occurring species.

Due to recently implemented annual catch limits, the recreational season for black sea bass has been substantially shortened. Therefore, bycatch of black sea bass is likely occurring when recreational fishermen target co-occurring species. Lowering the bag limit and extending the black sea bass fishing has the potential to reduce bycatch of black sea bass. However, survival of release black sea bass is expected to be high as release mortality is estimated to be 15%.

Therefore reduced catch limits for multiple species or closing co-occurring species at the same time could have the effect of reducing effort, which in turn could reduce bycatch.

If recreational ACLs for many co-occurring species are met, the AM would be to shorten the following fishing season. Extended closures for co-occurring species could reduce bycatch and enhance the reproductive potential of fish stocks, particularly if closures occurred during seasonal and/or longer closures of both commercial and recreational fisheries specified in Snapper Grouper Amendment 16 could also reduce bycatch mortality of species included in the Regulatory Amendment 9. For example, Amendment 16 established a January - April spawning season closure for gag, red grouper, black grouper, scamp, rock hind, red hind, coney, graysby, yellowfin grouper, yellowmouth grouper, and tiger grouper. These species are in spawning condition from December through April each year and many form spawning aggregations when they are extremely vulnerable to fishing pressure. Groupers change sex from female to male and there is evidence that males can be selectively removed from spawning aggregations, which could affect reproductive success. Furthermore, the largest most fecund females could also be selectively removed by fishing gear. Therefore, a spawning season closure for all shallow water grouper species implemented through Snapper Grouper Amendment 16 would be expected to protect grouper species when they are most vulnerable to capture, reduce bycatch of co-occurring grouper species, increase the percentage of males in grouper populations, enhance reproductive success, and increase the magnitude of recruitment.

Snapper Grouper Amendment 16 required the use of dehooking devices, which could help reduce bycatch of vermilion snapper, black sea bass, gag, and greater amberjack. Dehooking devices can allow fishermen to remove hooks with greater ease and more quickly from snapper grouper species without removing the fish from the water. If a fish does need to be removed from the water, dehookers could still reduce handling time in removing hooks, thus increasing survival (Cooke *et al.* 2001). Furthermore, Snapper Grouper Amendment 17A required circle hooks for snapper-grouper species north of 28 degrees latitude, which is expected to reduce bycatch mortality of snapper grouper species. Amendment 13C increased the mesh size in the back panel of black sea bass pots, which has likely reduced the magnitude of black sea bass regulatory discards in the commercial sector.

2. Ecological Effects Due to Changes in the Bycatch

The ecological effects of bycatch mortality are the same as fishing mortality from directed fishing efforts. If not properly managed and accounted for, either form of mortality could potentially reduce stock biomass to an unsustainable level. Actions proposed in Regulatory Amendment 9 could reduce bycatch by extending the fishing season but could also have the effect of increasing bycatch on individual trips. Many of the species in the snapper grouper fishery management unit have spatial and temporal coincidence and the benefits could be shared among them.

Data from North Carolina presented to the Council indicated fishermen with snapper grouper permits also fish in the nearshore gillnet fisheries. Fishermen with snapper grouper permits in other areas also participate in various state fisheries. It is expected that if efforts shift to these fisheries, there could be impacts to protected species. Current monitoring programs will allow NOAA Fisheries Service to track and evaluate any increased risk to protected species. If necessary, an Endangered Species Act (ESA) consultation can be re-initiated to address any increased levels of risk to ESA-listed species.

Amendment 18A is being developed by the Council, which includes actions that could restrict the number of pots a fisherman can used and could require that pots be returned to port at the completion of a trip. These actions could help reduce the incidence of “ghost fishing” by lost pots and reduce interaction of protected species with lines on black sea bass pots.

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

Management measures proposed in Regulatory Amendment 9 are intended to reduce the chance that derby fisheries will occur for black sea bass, vermilion snapper, and gag, as well as extend the recreational fishing season for black sea bass. The actions could reduce bycatch of snapper grouper species to some degree by extending the season for black sea bass, vermilion snapper, greater amberjack, and gag. However, increased bycatch on individual trips could occur when fishermen meet newly established trip limits for vermilion snapper and gag or a reduced bag limit for black sea bass. Overall levels of harvest of species in Regulatory Amendment 9 are expected to remain the same. Thus, any ecological changes in the community structure of reef ecosystems through the proposed actions would be expected to be small. These ecological changes could affect the nature and magnitude of bycatch over time.

4. Effects on Marine Mammals and Birds

Under Section 118 of the Marine Mammal Protection Act (MMPA), NMFS must publish, at least annually, a List of Fisheries (LOF) that places all U.S. commercial fisheries into one of three categories based on the level of incidental serious injury and mortality of marine mammals that occurs in each fishery. Of the gear utilized within the snapper grouper fishery, only the black sea bass pot is considered to pose an entanglement risk to marine mammals. The southeast U.S. Atlantic black sea bass pot fishery is included in the grouping of the Atlantic mixed species trap/pot fisheries, which the 2010 proposed List of Fisheries classifies as a Category II (74 FR 27739; June 11, 2009). Gear types used in these fisheries are determined to have occasional incidental mortality and serious injury of marine mammals. For the snapper grouper fishery, the best available data on protected species interactions are from the Southeast Fisheries Science Center (SEFSC) Supplementary Discard Data Program (SDDP) initiated in July of 2001 and sub-samples 20% of the vessels with an active permit. Since August 2001, only three interactions with marine mammals have been documented; each was taken by handline gear and each released alive (McCarthy SEFSC database). The bottom longline/hook-and-line component of the South Atlantic snapper grouper fishery remains a Category III under the LOF.

Although the black sea bass pot fishery can pose an entanglement risk to large whales due to their distribution and occurrence, sperm, fin, sei, and blue whales are unlikely to overlap with the black sea bass pot fishery operated within the snapper grouper fishery since it is executed primarily off North Carolina and South Carolina in waters ranging from 70-120 feet deep (21.3-36.6 meters). There are no known interactions between the black sea bass pot fishery and large whales. NOAA Fisheries Service's biological opinion on the continued operation of the South Atlantic snapper grouper fishery determined the possible adverse effects resulting from the fishery are extremely unlikely. Thus, the continued operation of the snapper grouper fishery in the southeast U.S. Atlantic EEZ is not likely to adversely affect sperm, fin, sei, and blue whales (NMFS 2006).

North Atlantic right and humpback whales may overlap both spatially and temporally with the black sea bass pot fishery. Recent revisions to the Atlantic Large Whale Take Reduction Plan have folded the Atlantic mixed species trap/pot fisheries into the plan (72 FR 193; October 5, 2007). The new requirements will help further reduce the likelihood of North Atlantic right and humpback whale entanglement in black sea bass pot gear.

The Bermuda petrel and roseate tern occur within the action area. Bermuda petrels are occasionally seen in the waters of the Gulf Stream off the coasts of North Carolina and South Carolina during the summer. Sightings are considered rare and only occurring in low numbers (Alsop 2001). Roseate terns occur widely along the Atlantic coast during the summer but in the southeast region, they are found mainly off the Florida Keys (unpublished USFWS data). Interaction with fisheries has not been reported as a concern for either of these species.

Fishing effort reductions have the potential to reduce the amount of interactions between the fishery and marine mammals and birds. Although, the Bermuda petrel and roseate tern occur within the action area, these species are not commonly found and neither has been described as associating with vessels or having had interactions with the snapper grouper fishery. Thus, it is believed that the snapper grouper fishery is not likely to negatively affect the Bermuda petrel and the roseate tern.

5. Changes in Fishing, Processing, Disposal, and Marketing Costs

Actions in Regulatory Amendment 9 would be expected to affect the cost of fishing operations. It is likely that all four states (NC, SC, GA & FL) would be affected by the regulations (trip limits, bag limits, etc.). Additionally, factors such as waterfront property values, availability of less expensive imports, etc. may affect economic decisions made by recreational and commercial fishermen. Amendment 18A (under development) proposes to enhance current data collection programs. This might provide more insight in calculating the changes in fishing, processing, disposal and marketing costs.

6. Changes in Fishing Practices and Behavior of Fishermen

Actions proposed in Regulatory Amendment 9 could result in a modification of fishing practices by commercial and recreational fishermen, thereby affecting the magnitude of discards. However, it is difficult to quantify any of the measures in terms of reducing discards until the magnitude of bycatch has been monitored over several years.

7. Changes in Research, Administration, and Enforcement Costs and Management Effectiveness

Research and monitoring is needed to understand the effectiveness of proposed management measure in reducing bycatch. Additional work is needed to determine the effectiveness of measures in the Regulatory Amendment 9, recently implemented amendments, and by future actions being proposed by the Council to reduce bycatch. Amendment 18A is being developed, which proposes to enhance current data collection programs. Some observer information has recently been provided by MARFIN and Cooperative Research Programs but more is needed. Approximately 20% of commercial fishermen are asked to fill out discard information in logbooks; however, a greater percentage of fishermen could be selected with emphasis on individuals that dominate landings. The use of electronic logbooks could be enhanced to enable fishery managers to obtain information on species composition, size distribution, geographic range, disposition, and depth of fishes that are released. Additional administrative and enforcement efforts will be needed to implement and enforce these regulations. NOAA Fisheries Service established the South East Fishery-Independent Survey in 2010 to strengthen fishery-independent sampling efforts in southeast US waters, addressing both immediate (e.g., red snapper) and long-term fishery-independent data needs, with an overarching goal of improving fishery-independent data utility for stock assessments. Meeting these data needs is critical to improving scientific advice to the management process, ensuring overfishing does not occur, and successfully rebuilding overfished stocks on schedule.

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

Preferred management measures, including those that are likely to increase or decrease discards could result in social and/or economic impacts as discussed in **Section 4**.

9. Changes in the Distribution of Benefits and Costs

Measure proposed in Regulatory Amendment 9 including trip limits, split season quotas, and bag limit adjustments could extend the length of fishing seasons, help to reduce bycatch, and affect the cost of fishing operations. Establishing a trip limit for vermilion snapper and gag would have different economic effects on participants from various states. Alternatively, an increased commercial trip limit for greater amberjack would represent a small economic gain for some fishermen that are impacted by the restricted take of other species.

10. Social Effects

The social effects of all the management measure, including those most likely to reduce bycatch, are described in **Section 4**.

11. Conclusion

This section evaluates the practicability of taking additional action to minimize bycatch and bycatch mortality using the ten factors provided at 50 CFR 600.350(d)(3)(i). In summary, extending the fishing season through the establishment of trip limits for vermilion snapper and gag, increasing the trip limit for greater amberjack, establishing a split season quota for black sea bass, reducing the black sea bass bag limit could reduce bycatch. However, increased bycatch could also be experienced on individual trips with a lower bag limit and an established trip limit. The requirements of dehooking devices, circle hooks, a recreational/commercial seasonal closure for gag, reduction of recreational bag limits, and closing all shallow water groupers when a gag quota is met or during a gag seasonal closure specified in previous amendments could also help to reduce bycatch.

Appendix H. History of Management

Table H-1. History of Management for the Snapper Grouper Fishery of the South Atlantic Region.

Document	All Actions Effective By:	Proposed Rule/ Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
FMP (1983)	08/31/83	PR: 48 FR 26843 FR: 48 FR 39463	-12" limit – red snapper, yellowtail snapper, red grouper, Nassau grouper -8" limit – black sea bass -4" trawl mesh size -Gear limitations – poisons, explosives, fish traps, trawls -Designated modified habitats or artificial reefs as Special Management Zones (SMZs)
Regulatory Amendment #1 (1986)	03/27/87	PR: 51 FR 43937 FR: 52 FR 9864	-Prohibited fishing in SMZs except with hand-held hook-and-line and spearfishing gear. -Prohibited harvest of goliath grouper in SMZs.
Amendment #1 (1988)	01/12/89	PR: 53 FR 42985 FR: 54 FR 1720	-Prohibited trawl gear to harvest fish south of Cape Hatteras, NC and north of Cape Canaveral, FL. -Directed fishery defined as vessel with trawl gear and ≥200 lbs s-g on board. -Established rebuttable assumption that vessel with s-g on board had harvested such fish in EEZ.
Regulatory Amendment #2 (1988)	03/30/89	PR: 53 FR 32412 FR: 54 FR 8342	-Established 2 artificial reefs off Ft. Pierce, FL as SMZs.
Notice of Control Date	09/24/90	55 FR 39039	-Anyone entering federal wreckfish fishery in the EEZ off S. Atlantic states after 09/24/90 was not assured of future access if limited entry program developed.
Regulatory Amendment #3 (1989)	11/02/90	PR: 55 FR 28066 FR: 55 FR 40394	-Established artificial reef at Key Biscayne, FL as SMZ. Fish trapping, bottom longlining, spear fishing, and harvesting of Goliath grouper prohibited in SMZ.
Amendment #2 (1990)	10/30/90	PR: 55 FR 31406 FR: 55 FR 46213	-Prohibited harvest/possession of goliath grouper in or from the EEZ -Defined overfishing for goliath grouper and other species

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Emergency Rule	8/3/90	55 FR 32257	-Added wreckfish to the FMU -Fishing year beginning 4/16/90 -Commercial quota of 2 million pounds -Commercial trip limit of 10,000 pounds per trip
Fishery Closure Notice	8/8/90	55 FR 32635	- Fishery closed because the commercial quota of 2 million pounds was reached
Emergency Rule Extension	11/1/90	55 FR 40181	-extended the measures implemented via emergency rule on 8/3/90
Amendment #3 (1990)	01/31/91	PR: 55 FR 39023 FR: 56 FR 2443	-Added wreckfish to the FMU; -Defined optimum yield and overfishing -Required permit to fish for, land or sell wreckfish; -Required catch and effort reports from selected, permitted vessels; -Established control date of 03/28/90; -Established a fishing year for wreckfish starting April 16; -Established a process to set annual quota, with initial quota of 2 million pounds; provisions for closure; -Established 10,000 pound trip limit; -Established a spawning season closure for wreckfish from January 15 to April 15; and -Provided for annual adjustments of wreckfish management measures;
Notice of Control Date	07/30/91	56 FR 36052	-Anyone entering federal snapper grouper fishery (other than for wreckfish) in the EEZ off S. Atlantic states after 07/30/91 was not assured of future access if limited entry program developed.

Document	**All Actions Effective By:**	**Proposed Rule/ Final Rule**	**Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.**
Amendment #4 (1991)	01/01/92	PR: 56 FR 29922 FR: 56 FR 56016	-Prohibited gear: fish traps except black sea bass traps north of Cape Canaveral, FL; entanglement nets; longline gear inside 50 fathoms; bottom longlines to harvest wreckfish**; powerheads and bangsticks in designated SMZs off S. Carolina. -defined overfishing/overfished and established rebuilding timeframe: red snapper and groupers ≤ 15 years (year 1 = 1991); other snappers, greater amberjack, black sea bass, red porgy ≤ 10 years (year 1 = 1991) -Required permits (commercial & for-hire) and specified data collection regulations -Established an assessment group and annual adjustment procedure (framework) -Permit, gear, and vessel id requirements specified for black sea bass traps. -No retention of snapper grouper spp. caught in other fisheries with gear prohibited in snapper grouper fishery if captured snapper grouper had no bag limit or harvest was prohibited. If had a bag limit, could retain only the bag limit. -8" limit – lane snapper -10" limit – vermilion snapper (recreational only) -12" limit – red porgy, vermilion snapper (commercial only), gray, yellowtail, mutton, schoolmaster, queen, blackfin, cubera, dog, mahogany, and silk snappers -20" limit – red snapper, gag, and red, black, scamp, yellowfin, and yellowmouth groupers. -28" FL limit – greater amberjack (recreational only) -36" FL or 28" core length – greater amberjack (commercial only) -bag limits – 10 vermilion snapper, 3 greater amberjack -aggregate snapper bag limit – 10/person/day, excluding vermilion snapper and allowing no more than 2 red snappers -aggregate grouper bag limit – 5/person/day, excluding Nassau and goliath grouper, for which no retention (recreational & commercial) is allowed -spawning season closure – commercial harvest greater amberjack > 3 fish bag prohibited in April south of Cape Canaveral, FL -spawning season closure – commercial harvest mutton snapper >snapper aggregate prohibited during May and June -charter/headboats and excursion boat possession limits extended

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Amendment #5 (1991)	04/06/92	PR: 56 FR 57302 FR: 57 FR 7886	-Wreckfish: established limited entry system with ITQs; required dealer to have permit; rescinded 10,000 lb. trip limit; required off-loading between 8 am and 5 pm; reduced occasions when 24-hour advance notice of offloading required for off-loading; established procedure for initial distribution of percentage shares of TAC
Emergency Rule	8/31/92	57 FR 39365	-Black Sea Bass (bsb): modified definition of bsb pot; allowed multi-gear trips for bsb; allowed retention of incidentally-caught fish on bsb trips
Emergency Rule Extension	11/30/92	57 FR 56522	-Black Sea Bass: modified definition of bsb pot; allowed multi-gear trips for bsb; allowed retention of incidentally-caught fish on bsb trips
Regulatory Amendment #4 (1992)	07/06/93	FR: 58 FR 36155	-Black Sea Bass: modified definition of bsb pot; allowed multi-gear trips for bsb; allowed retention of incidentally-caught fish on bsb trips
Regulatory Amendment #5 (1992)	07/31/93	PR: 58 FR 13732 FR: 58 FR 35895	-Established 8 SMZs off S. Carolina, where only hand-held, hook-and-line gear and spearfishing (excluding powerheads) was allowed.
Amendment #6 (1993)	07/27/94	PR: 59 FR 9721 FR: 59 FR 27242	-commercial quotas for snowy grouper, golden tilefish -commercial trip limits for snowy grouper, golden tilefish, speckled hind, and warsaw grouper -include golden tilefish in grouper recreational aggregate bag limits -prohibited sale of warsaw grouper and speckled hind -100% logbook coverage upon renewal of permit -creation of the *Oculina* Experimental Closed Area -data collection needs specified for evaluation of possible future IFQ system
Amendment #7 (1994)	01/23/95	PR: 59 FR 47833 FR: 59 FR 66270	-12" FL – hogfish -16" TL – mutton snapper -required dealer, charter and headboat federal permits -allowed sale under specified conditions -specified allowable gear and made allowance for experimental gear -allowed multi-gear trips in N. Carolina -added localized overfishing to list of problems and objectives -adjusted bag limit and crew specs. for charter and head boats -modified management unit for scup to apply south of Cape Hatteras, NC -modified framework procedure
Regulatory Amendment #6 (1994)	05/22/95	PR: 60 FR 8620 FR: 60 FR 19683	Established actions which applied only to EEZ off Atlantic coast of FL: Bag limits – 5 hogfish/person/day (recreational only), 2 cubera snapper/person/day > 30" TL; 12" TL gray triggerfish
Notice of Control Date	04/23/97	62 FR 22995	-Anyone entering federal bsb pot fishery off S. Atlantic states after 04/23/97 was not assured of future access if limited entry program developed.

Document	All Actions Effective By:	Proposed Rule/ Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
Amendment #8 (1997)	12/14/98	PR: 63 FR 1813 FR: 63 FR 38298	-established program to limit initial eligibility for snapper grouper fishery: Must demonstrate landings of any species in SG FMU in 1993, 1994, 1995 or 1996; and have held valid SG permit between 02/11/96 and 02/11/97. -granted transferable permit with unlimited landings if vessel landed ≥ 1,000 lbs. of snapper grouper spp. in any of the years -granted non-transferable permit with 225 lb. trip limit to all other vessels -modified problems, objectives, OY, and overfishing definitions -expanded Council's habitat responsibility -allowed retention of snapper grouper spp. in excess of bag limit on permitted vessel with a single bait net or cast nets on board -allowed permitted vessels to possess filleted fish harvested in the Bahamas under certain conditions.
Regulatory Amendment #7 (1998)	01/29/99	PR: 63 FR 43656 FR: 63 FR 71793	-Established 10 SMZs at artificial reefs off South Carolina.
Interim Rule Request	1/16/98		-Council requested all Amendment 9 measures except black sea bass pot construction changes be implemented as an interim request under MSA
Action Suspended	5/14/98		-NMFS informed the Council that action on the interim rule request was suspended
Emergency Rule Request	9/24/98		-Council requested Amendment 9 be implemented via emergency rule
Request not Implemented	1/22/99		-NMFS informed the Council that the final rule for Amendment 9 would be effective 2/24/99; therefore they did not implement the emergency rule

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Amendment #9 (1998)	2/24/99	PR: 63 FR 63276 FR: 64 FR 3624	-<u>Red porgy</u>: 14" length (recreational and commercial); 5 fish rec. bag limit; no harvest or possession > bag limit, and no purchase or sale, in March and April. -<u>Black sea bass</u>: 10" length (recreational and commercial); 20 fish rec. bag limit; required escape vents and escape panels with degradable fasteners in bsb pots -<u>Greater amberjack</u>: 1 fish rec. bag limit; no harvest or possession > bag limit, and no purchase or sale, during April; quota = 1,169,931 lbs; began fishing year May 1; prohibited coring. -<u>Vermilion snapper</u>: 11" length (recreational) Gag: 24" length (recreational); no commercial harvest or possession > bag limit, and no purchase or sale, during March and April -<u>Black grouper</u>: 24" length (recreational and commercial); no harvest or possession > bag limit, and no purchase or sale, during March and April. -<u>Gag and Black grouper</u>: within 5 fish aggregate grouper bag limit, no more than 2 fish may be gag or black grouper (individually or in combination) -<u>All SG without a bag limit</u>: aggregate recreational bag limit 20 fish/person/day, excluding tomtate and blue runners -<u>Vessels with longline gear</u> aboard may only possess snowy, warsaw, yellowedge, and misty grouper, and golden, blueline and sand tilefish.
Amendment #9 (1998) resubmitted	10/13/00	PR: 63 FR 63276 FR: 65 FR 55203	-Commercial trip limit for greater amberjack
Regulatory Amendment #8 (2000)	11/15/00	PR: 65 FR 41041 FR: 65 FR 61114	-Established 12 SMZs at artificial reefs off Georgia; revised boundaries of 7 existing SMZs off Georgia to meet CG permit specs; restricted fishing in new and revised SMZs
Emergency Interim Rule	09/08/99, expired 08/28/00	64 FR 48324 and 65 FR 10040	-Prohibited harvest or possession of red porgy.
Emergency Action	9/3/99	64 FR 48326	-Reopened the Amendment 8 permit application process
Amendment #10 (1998)	07/14/00	PR: 64 FR 37082 and 64 FR 59152 FR: 65 FR 37292	-Identified EFH and established HAPCs for species in the SG FMU.

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Amendment #11 (1998d)	12/02/99	PR: 64 FR 27952 FR: 64 FR 59126	-MSY proxy: goliath and Nassau grouper = 40% static SPR; all other species = 30% static SPR -OY: hermaphroditic groupers = 45% static SPR; goliath and Nassau grouper = 50% static SPR; all other species = 40% static SPR -Overfished/overfishing evaluations: BSB: overfished (MSST=3.72 mp, 1995 biomass=1.33 mp); undergoing overfishing (MFMT=0.72, F1991-1995=0.95) Vermilion snapper: overfished (static SPR = 21-27%). Red porgy: overfished (static SPR = 14-19%). Red snapper: overfished (static SPR = 24-32%) Gag: overfished (static SPR = 27%) Scamp: no longer overfished (static SPR = 35%) Speckled hind: overfished (static SPR = 8-13%) Warsaw grouper: overfished (static SPR = 6-14%) Snowy grouper: overfished (static SPR = 5=15%) White grunt: no longer overfished (static SPR = 29-39%) Golden tilefish: overfished (couldn't estimate static SPR) Nassau grouper: overfished (couldn't estimate static SPR) Goliath grouper: overfished (couldn't estimate static SPR) -overfishing level: goliath and Nassau grouper = F>F40% static SPR; all other species: = F>F30% static SPR Approved definitions for overfished and overfishing. MSST = [(1-M) or 0.5 whichever is greater]* B_{MSY}. MFMT = F_{MSY}
Amendment #12 (2000)	09/22/00	PR: 65 FR 35877 FR: 65 FR 51248	-Red porgy: MSY=4.38 mp; OY=45% static SPR; MFMT=0.43; MSST=7.34 mp; rebuilding timeframe=18 years (1999=year 1); no sale during Jan-April; 1 fish bag limit; 50 lb. bycatch comm. trip limit May-December; modified management options and list of possible framework actions.
Amendment #13A (2003)	04/26/04	PR: 68 FR 66069 FR: 69 FR 15731	-Extended for an indefinite period the regulation prohibiting fishing for and possessing snapper grouper spp. within the *Oculina* Experimental Closed Area.
Notice of Control Date	10/14/05	70 FR 60058	-The Council is considering management measures to further limit participation or effort in the commercial fishery for snapper grouper species (excluding Wreckfish).
Amendment #13C (2006)	10/23/06	PR: 71 FR 28841 FR: 71 FR 55096	- End overfishing of snowy grouper, vermilion snapper, black sea bass, and golden tilefish. Increase allowable catch of red porgy. Year 1 = 2006. 1. Snowy Grouper Commercial: Quota (gutted weight) = 151,000 lbs gw in year 1, 118,000 lbs gw in year 2, and 84,000 lbs gw in year 3 onwards. Trip limit = 275

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			lbs gw in year 1, 175 lbs gw in year 2, and 100 lbs gw in year 3 onwards. Recreational: Limit possession to one snowy grouper in 5 grouper per person/day aggregate bag limit. 2. Golden Tilefish Commercial: Quota of 295,000 lbs gw, 4,000 lbs gw trip limit until 75% of the quota is taken when the trip limit is reduced to 300 lbs gw. Do not adjust the trip limit downwards unless 75% is captured on or before September 1. Recreational: Limit possession to 1 golden tilefish in 5 grouper per person/day aggregate bag limit. 3. Vermilion Snapper Commercial: Quota of 1,100,000 lbs gw. Recreational: 12" size limit. 4. Black Sea Bass Commercial: Commercial quota (gutted weight) of 477,000 lbs gw in year 1, 423,000 lbs gw in year 2, and 309,000 lbs gw in year 3 onwards. Require use of at least 2" mesh for the entire back panel of black sea bass pots effective 6 months after publication of the final rule. Require black sea bass pots be removed from the water when the quota is met. Change fishing year from calendar year to June 1 – May 31. Recreational: Recreational allocation of 633,000 lbs gw in year 1, 560,000 lbs gw in year 2, and 409,000 lbs gw in year 3 onwards. Increase minimum size limit from 10" to 11" in year 1 and to 12" in year 2. Reduce recreational bag limit from 20 to 15 per person per day. Change fishing year from the calendar year to June 1 through May 31. 5. Red Porgy Commercial and recreational 1. Retain 14" TL size limit and seasonal closure (retention limited to the bag limit); 2. Specify a commercial quota of 127,000 lbs gw and prohibit sale/purchase and prohibit harvest and/or possession beyond the bag limit when quota is taken and/or during January through April; 3. Increase commercial trip limit from 50 lbs ww to 120 red porgy (210 lbs gw) during May through December; 4. Increase recreational bag limit from one to three red porgy per person per day.
Notice of Control Date	3/8/07	72 FR 60794	-The Council may consider measures to limit participation in the snapper grouper for-hire fishery
Amendment #14 (2007) Sent to NMFS 7/18/07	2/12/09	PR: 73 FR 32281 FR: 74 FR 1621	-Establish eight deepwater Type II marine protected areas (MPAs) to protect a portion of the population and habitat of long-lived deepwater snapper grouper species.
Amendment #15A (2007)	3/14/08	73 FR 14942	- Establish rebuilding plans and SFA parameters for snowy grouper, black sea bass, and red porgy.

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Amendment #15B (2008b)	2/15/10	PR: 74 FR 30569 FR: 74 FR 58902	- Prohibit the sale of bag-limit caught snapper grouper species. -Reduce the effects of incidental hooking on sea turtles and smalltooth sawfish. - Adjust commercial renewal periods and transferability requirements. - Implement plan to monitor and assess bycatch, - Establish reference points for golden tilefish. - Establish allocations for snowy grouper (95% com & 5% rec) and red porgy (50% com & 50% rec).
Amendment #16 (SAFMC 2008c)	7/29/09	PR: 74 FR 6297 FR: 74 FR 30964	-Specify SFA parameters for gag and vermilion snapper -For gag grouper: Specify interim allocations 51%com & 49%rec; rec & com spawning closure January through April; directed com quota=348,440 pounds gutted weight; reduce 5-grouper aggregate to 3-grouper and 2 gag/black to 1 gag/black and exclude captain & crew from possessing bag limit. -For vermilion snapper: Specify interim allocations 68%com & 32%rec; directed com quota split Jan-June=168,501 pounds gutted weight and 155,501 pounds July-Dec; reduce bag limit from 10 to 4 and a rec closed season October through May 15. In addition, the NMFS RA will set new regulations based on new stock assessment. -Require dehooking tools.
Amendment #17A (SAFMC 2010a)	12/3/10	PR: 75 FR 49447 FR: 75 FR 76874	-Specify an ACL and an AM for red snapper with management measures to reduce the probability that catches will exceed the stocks' ACL -Specify a rebuilding plan for red snapper -Specify status determination criteria for red snapper -Specify a monitoring program for red snapper
Emergency Rule	12/3/10	75 FR 76890	- Delay the effective date of the area closure for snapper grouper species implemented through Amendment 17A
Amendment #17B (SAFMC 2010b)	January 31, 2011	PR: 75 FR 62488 FR: 75 FR 82280	-Specify ACLs, ACTs, and AMs, where necessary, for 9 species undergoing overfishing. -Modify management measures as needed to limit harvest to the ACL or ACT. -Update the framework procedure for specification of total allowable catch.
Notice of Control Date	12/4/08	TBD	Establishes a control date for the golden tilefish fishery of the South Atlantic

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Notice of Control Date	12/4/08	TBD	- Establishes control date for black sea bass pot fishery of the South Atlantic
Amendment #18A (TBD)	TBD	TBD	- Limit participation and effort in the golden tilefish fishery - Modifications to management of the black sea bass pot fishery - Separate snowy grouper quota into regions/states - Separate the gag recreational allocation into regions/states - Change the golden tilefish fishing year - Improve the accuracy, timing, and quantity of fisheries statistics
Amendment #19 (included in Comprehensive Ecosystem-based Amendment 1) (SAFMC 2010c)	7/22/10	PR: 3/26/10 FR: 6/22/10	-Provide presentation of spatial information for Essential Fish Habitat (EFH) and EFH-Habitat Areas of Particular Concern (EFH-HAPC) designations under the Snapper Grouper FMP
Amendment #20	TBD	TBD	-Update wreckfish ITQ according to reauthorized MSFCMA -Establish ACLs, AMs, and management reference points for wreckfish fishery
Amendment #21	TBD	TBD	- Establish effort controls for various species including: trip limits, effort and participation reductions, endorsements, catch shares, regional quotas, and state-by-state quotas.
Amendment #22	TBD	TBD	- Establish measures to maintain long-term red snapper harvest at or below the ACL. Options include trip limits, bag limits, catch shares, tagging programs, endorsements, spawning season/area closures, gear requirements, and special management zones.
Amendment #23 (included in Comprehensive Ecosystem-based Amendment 2)	TBD	TBD	- Designate the Deepwater MPAs as EFH-HAPCs - Limit harvest of snapper grouper species in SC Special Management Zones to the bag limit - Modify sea turtle release gear

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Comprehensive ACL Amendment	TBD	TBD	-Establish ABC control rules, establish ABCs, ACLs, and AMs for species not undergoing overfishing -Remove some species from South Atlantic FMU -Specify allocations among the commercial, recreational, and for-hire sectors for species not undergoing overfishing -Limit the total mortality for federally managed species in the South Atlantic to the ACLs
Amendment #24	TBD	TBD	-Specify MSY, rebuilding plan (including ACLs, AMs, and OY), and allocations for red grouper