Regulatory Amendment 16

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

Changes to the
Seasonal Closure for the Black Sea Bass Pot Sector

Including an Environmental Impact Statement

Draft Version

February 2, 2015

A publication of the South Atlantic Fishery Management Council pursuant to
National Oceanic and Atmospheric Administration
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Abbreviations and Acronyms Used in the FMP

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

Regulatory Amendment 16 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with an Environmental Impact Statement

Proposed action:	Reconsider the annual November 1 through April 30 prohibition on the use of black sea bass pot gear
Lead agency:	FMP Amendment – South Atlantic Fishery Management Council Environmental Impact Statement – National Marine Fisheries Service (NMFS), Southeast Regional Office
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Chapter 1.
Introduction

1.1 What Actions Are Being Proposed?

Fishery managers are reconsidering the annual prohibition on the use of commercial black sea bass pot gear from November 1 through April 30.

1.2 Who is Proposing the Actions?

The South Atlantic Fishery Management Council (Council) is proposing the action. The Council develops the regulatory amendment and submits it to the National Marine Fisheries Service (NMFS) who publishes a rule to implement the regulatory amendment on behalf of the Secretary of Commerce. NMFS is an agency in the National Oceanic and Atmospheric Administration.

South Atlantic Fishery Management Council

- Responsible for conservation and management of fish stocks
- Consists of 13 voting members: 8 appointed by the Secretary of Commerce, 1 representative from each of the 4 South Atlantic states, the Southeast Regional Director of NMFS; and 4 non-voting members
- Responsible for developing fishery management plans and amendments under the Magnuson-Stevens Act and recommends actions to NMFS for implementation
- Management area for most species is from 3 to 200 miles off the coasts of North Carolina, South Carolina, Georgia, and east Florida through Key West with the exception of Mackerel which is from New York to Florida, and Dolphin-Wahoo, which is from Maine to Florida
- Sea bass pots in the South Atlantic EEZ may be used between 35°15.19′ N. lat. (due east of Cape Hatteras Light, NC) and 28°35.1′ N. lat. (due east of the NASA Vehicle Assembly Building, Cape Canaveral, FL)

1.3 Why is the Council Considering Action?/Purpose & Need

In 2013, a stock assessment concluded that the black sea bass stock in the South Atlantic is not undergoing overfishing, is not overfished, and is rebuilt. In response to the stock assessment, the Council's Scientific and Statistical Committee (SSC), at their April 2013 meeting, recommended an increase to the acceptable biological catch (ABC) for black sea bass. The increase in the ABC allowed the commercial and recreational annual catch limits (ACL) to increase. The Council and NMFS, through Regulatory Amendment 19 to the Fishery Management Plan (FMP) for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP) (SAFMC 2013), modified the ABC, ACLs, recreational annual catch target (ACT), and optimum yield (OY) for the black sea bass stock.

The increase to the commercial ACL could have extended fishing activity with black sea bass pot gear past November 1, the onset of right whale calving season in the South Atlantic and migration of large Endangered Species Act (ESA)-listed whales. Because black sea bass pot gear could potentially be used past November 1, the Council and NMFS implemented a prohibition on the use of black sea bass pot gear from November 1 through April 30 each year, beginning in 2013 to protect large whales from risk of entanglement.

Without the prohibition on the use of black sea bass pots during the large whale migration and right whale calving season, a re-initiation of formal consultation for the snapper grouper fishery probably would have been triggered under the ESA. The consultation would have required development of a biological opinion to perform the additional analyses to evaluate the effects of black sea bass pot gear on ESA listed species. Those analyses would not have been completed in time to allow the ACL increases to be implemented for the 2013-2014 fishing season, which began on June 1. The black sea bass pot prohibition was a precautionary step taken by the Council and NMFS to allow the black sea bass ACL to increase in the 2013-2014 fishing year, while preventing entanglements with ESA-listed whales until a comprehensive biological impact analysis could be completed.

Purpose for Action

The purpose of Regulatory Amendment 16 is to reconsider the annual November 1 through April 30 prohibition on the use of black sea bass pot gear and modify buoy line/weak link gear requirements and buoy line rope marking for black sea bass pots required by the Atlantic Large Whale Take Reduction Plan..

Need for Action

The need for the amendment is to minimize adverse socioeconomic impacts to black sea bass pot endorsement holders while ~~considering the need to~~ protecting ESA-listed whales in the South Atlantic region.

An IPT member recommends that the Council consider clarifying the purpose by changing "reconsider" to "reduce the scope of". Two IPT members recommend changing "modify" to "enhance".

An IPT member recommends that the Council consider clarifying, if it is true, that the need is to minimize adverse effects *specific to the closure* by adding the phrase "from the closure" after the word "holders" in the need.

In the need, one IPT member recommends the Council consider the removal of the word "adverse" as they feel that this level of economic impact most first be quantified in a comprehensive economic analysis.

In the purpose, one IPT member recommends the Council consider the removal of the phrase "required by the Atlantic Large Whale Take Reduction Plan" as they don't feel that the Council can legally modify ALWTRT regs.

One IPT member provided the following comment: The need for action is highly problematic. The IPT has consistently recommended against the use of the terms 'minimize' or 'maximize' when discussing impacts. The IPT has also consistently recommended against the term impacts without a directional qualifier (i.e., 'negative impacts'). Finally, this amendment proposes to INCREASE socioeconomic benefits by allowing fishing during a time it is currently prohibited. It's semantics, but I think the distinctions are significant enough to merit an additional set of IPT recommendations to the Council with further explanation of why we recommend the previous wording over this new wording. Also, why "while considering the need to protect" – why not just "while protecting" or "while maintaining sufficient protection for"?

Through Regulatory Amendment 16, the Council and NMFS are reconsidering the annual November 1 through April 30 prohibition on the use of black sea bass pot gear. Fishery managers are considering adjustments to both the geographical and temporal boundaries of the closure in order to minimize adverse socio-economic impacts to black sea bass pot endorsement holders while protecting ESA-listed whales in the South Atlantic region. During the scoping process for Regulatory Amendment 16, fishermen reported that fishing for black sea bass during winter months is important to them and claim that the fish migrate southward and are generally found closer to shore making them easier to harvest. Fishermen have also reported this time period is important due to the coloration of the fish. Fish tend to be darker during winter months, which commands a higher price on the market.

1.4 Where is the Management Area?

Management of the federal snapper grouper fishery located off the southeastern United States (South Atlantic) in the 3-200 nautical miles U.S. Exclusive Economic Zone is conducted under the Snapper Grouper FMP (SAFMC 1983). Sea bass pots in the South Atlantic EEZ may be used between 35°15.19′ N. lat. (due east of Cape Hatteras Light, NC) and 28°35.1′ N. lat. (due east of the NASA Vehicle Assembly Building, Cape Canaveral, FL) (**Figure 1.4.1**). Black sea bass is one of 59 fish managed by the Council under the Snapper Grouper FMP.

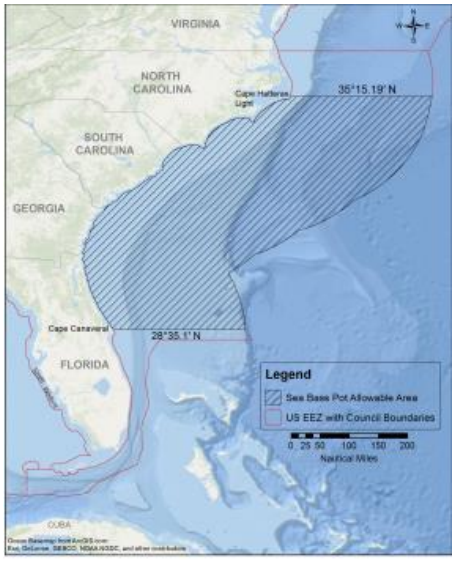

Figure 1.4.1. Jurisdictional boundaries of the South Atlantic Fishery Management Council and the allowable black sea bass pot area.

1.5 What is the Stock Status of Black Sea Bass in the South Atlantic Region?

The black sea bass stock is not undergoing overfishing, is not overfished, and is rebuilt (**Table 1.5.1**) (SEDAR 25 Update 2013). **Section 3.2.2** includes a detailed description of the stock assessment and results. The stock assessment update was conducted in early 2013, with data through 2012, through the Southeast Data, Assessment, and Review (SEDAR) process. Most of the data sources in this assessment were updated with the two additional years of observations available since the benchmark assessment SEDAR 25 (2011). The Council's SSC met to review the stock assessment in April 2013 and determined it was adequate and suitable to inform management decisions. The actions and alternatives in Regulatory Amendment 19 (SAFMC 2013) to increase the ACL were based on the results of this recent stock assessment update for black sea bass and the SSC's recommendation

Table 1.5.1. Stock status of black sea bass based on the SEDAR 25 Update 2013 assessment.

Status	SEDAR 25 Update 2013 (2012 most recent data)
Overfishing (F_{CURR}/MFMT value)	No (0.659)
Overfished (SSB_{CURR}/MSST value)	No (1.66)
Rebuilt (SSB_{CURR}/SSB_{MSY} value)	Yes (1.03)

- If F_{CURR}>MFMT, then undergoing overfishing. The higher the number, the greater degree of overfishing.
- If SSB_{CURR}<MSST, then overfished. The lower the number, the greater degree of overfished.
- If $SSB_{CURR}>SSB_{MSY}$, then the stock is rebuilt.

1.6 What Regulations Have the Council and NMFS Implemented Concerning Black Sea Bass in the South Atlantic Region?

1.6.1. Council Amendments

Amendment 13C to the Snapper Grouper FMP (SAFMC 2006) phased-in quota/total allowable catch reductions over 3 years to end overfishing, changed the fishing year from the calendar year to June 1 through May 31, required use of at least 2 inch (") mesh for the entire back panel of pots, required that pots be removed from the water when the commercial quota is met, increased the recreational minimum size limit from 10" total length (TL) to 11" TL in year 1 and 12" TL in year 2 onwards, and reduced the recreational bag limit from 20 to 15 per person per day.

Amendment 15A to the Snapper Grouper FMP (SAFMC 2008a) updated black sea bass management reference points and modified the rebuilding strategy. Amendment 15A to the Snapper Grouper FMP (SAFMC 2008a) established formulas for defining the maximum sustainable yield (MSY) for black sea bass. MSY equals the yield produced by F_{MSY} when the stock is at equilibrium. MSY and F_{MSY} are defined by the most recent SEDAR assessment.

Amendment 17B to the Snapper Grouper FMP (SAFMC 2010b) established ACLs and Ams for black sea bass and other snapper grouper species that were undergoing overfishing at the time.

Regulatory Amendment 9 to the Snapper Grouper FMP (SAFMC 2011a) reduced the recreational bag limit from 15 to 5 per person per day.

The Comprehensive ACL Amendment (SAFMC 2011c) includes ACLs and Ams for federally managed species not undergoing

overfishing in four FMPs (Snapper Grouper, Dolphin Wahoo, Golden Crab, and *Sargassum*). The Comprehensive ACL Amendment also established an ABC control rule.

Amendment 18A to the Snapper Grouper FMP (SAFMC 2012a) changed the definition of OY from the average yield associated with fishing at 75% of F_{MSY} when the stock is at equilibrium to a formula setting ACL = ABC = OY. Magnuson-Stevens Act national standard 1 establishes the relationship between conservation and management measures, preventing overfishing, and achieving OY from each stock complex, or fishery. Under this formula, the ACL/OY would be based on the ABC for black sea bass from the most recent SEDAR assessment, which takes into consideration scientific uncertainty to ensure catches are maintained below the MSY/overfishing limit (OFL). Amendment 18A (SAFMC 2012a) also modified the rebuilding strategy, ABC, ACLs, and ACTs; limited participation in the black sea bass pot sector (32 endorsements/vessels); limited pots to 35 per vessel; required that pots be brought back to shore after each trip; modified Ams; established a 1,000 pounds gutted weight (lbs gw) commercial trip limit; increased the recreational minimum size limit from 12" to 13" TL; and increased the commercial minimum size limit from 10" to 11" TL.

Regulatory Amendment 19 (SAFMC 2013) made adjustments to the ACLs (including sector ACLs), recreational ACT, and optimum yield for black sea bass based on the ABC recommendation of the SSC and established an annual prohibition on the use of black sea bass pots from November 1 through April 30 to minimize the probability of interactions between pot gear and ESA-listed whales during large whale migrations and right whale calving season off the southeastern coast. A Southeast Data, Assessment, and Review (SEDAR) stock assessment update for black sea bass was completed in 2013, and suggested the ACL for this species could be increased based upon the new ABC levels recommended by the SSC. The stock assessment update indicated black sea bass is no longer undergoing overfishing, is not overfished, and the stock is rebuilt. Based on the outcome of the stock assessment update for black sea bass, the SSC applied the approved ABC control rule to black sea bass, revised P* to be 40%, and recommended new ABC values for 2013-2015.

The Council and NMFS changed the commercial and recreational fishing years for black sea bass from June 1 through May 31 to January 1 through December 31 for the commercial sector and April 1 through March 31 for the recreational sector. The changes began in 2015.

For a detailed history of management of the snapper grouper fishery, please refer to **Appendix B**.

1.6.2 Atlantic Large Whale Take Reduction Plan

In addition to the Council regulations, the commercial black sea bass trap/pot fishery must adhere to regulations implemented under the Atlantic Large Whale Take Reduction Plan (ALWTRP). The ALWTRP seeks to reduce serious injury to and/or mortality of large whales due to incidental entanglement in U.S. commercial fishing gear. Since its implementation in 1997, NMFS has modified the ALWTRP on several occasions to address the risk of entanglement in gear employed by gillnet and trap/pot fisheries. Although the plan focuses on right, humpback, and fin whales, its implementation also benefits minke whales. The ALWTRP consists of restrictions on where and how gear can be set; research into whale populations, whale behavior, and fishing gear; outreach to inform fishermen of the entanglement problem and to seek their help in understanding and solving the problem; and a

program to disentangle whales that do get caught in gear.

ALWTRP trap/pot gear measures that apply to the southern commercial black sea bass trap/pot fishery are listed in **Table 1.6.1** and the times and areas where the restrictions apply in the South Atlantic are illustrated in **Figure 1.6.1**. These measures would remain in place regardless of any actions implemented through Regulatory Amendment 16.

Table 1.6.1. ALWTRP measures that are applicable to the commercial black sea bass trap/pot fishery.

Area	Requirements
Offshore Trap/Pot Waters	**Year-round**: • No buoy line floating at the surface. • No wet storage of gear (gear must be hauled ≤ 30 days). • Gear marking (color = black; 4in in length) • Weak links* ≤ 1,500 lbs on floats and/or weights • All ground lines must be made of sinking line.
Southern Nearshore Trap/Pot Waters	**Year-round**: • No buoy line floating at the surface. • No wet storage of gear (gear must be hauled ≤ 30 days). • Gear marking (color = orange; 4in in length) • Weak links* ≤ 600 lbs on floats and/or weights • All ground lines must be made of sinking line.
* Weak links must be chosen from the list of NMFS approved gear. Source: 50 CFR part 229.32, available online at http://www.nero.noaa.gov/whaletrp/.	

Comment [G1]: Does this table include the 2014 additions?

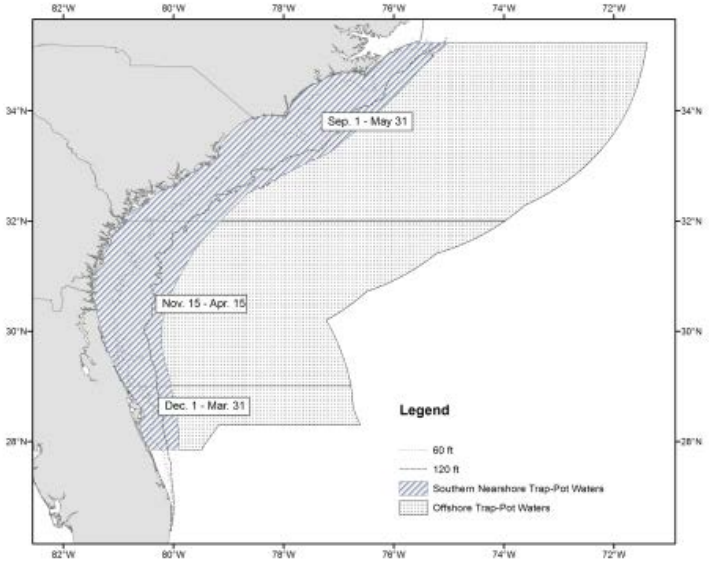

Figure 1.6.1. Times and areas where ALWTRP measures are in effect for the southern commercial black sea bass trap/pot fishery (only the SAFMC's BSB management area depicted).

Chapter 2. Proposed Action and Alternatives

Action 1. Modify the annual November 1 through April 30 prohibition on the use of black sea bass pot gear

An IPT member recommends changing "modify" to "reduce the scope" in the action title for clarification purposes.

2.1 Alternatives

Alternative 1 (No Action). Retention, possession, and fishing for black sea bass is prohibited using black sea bass pot gear, annually, from November 1 through April 30.

The following provisions currently exist that may reduce entanglements of whales listed under the Endangered Species Act. The South Atlantic Fishery Management Council does not intend to change these provisions through this amendment.

Amendment 18A to the Snapper Grouper Fishery Management Plan of the South Atlantic Region (SAFMC 2012a):

- Established an endorsement program that capped the number of vessels utilizing pot gear at 32;
- Limited the number of pots per vessel to 35;
- Required that pots be brought back to shore after each trip;
- Established a commercial trip limit of 1,000 lbs gw;

See **Table 1.6.1** for measures mandated through the Atlantic Large Whale Take Reduction Plan.

Alternative 2. The black sea bass pot closure applies to the area currently designated as North Atlantic right whale critical habitat **(Figure 2.1.1)**. North Atlantic right whale critical habitat encompasses waters between 31° 15'N, (approximately the mouth of the Altamaha River, Georgia) and 30° 15'N (approximately Jacksonville, Florida) from the shoreline out to 15 nautical miles offshore; and the waters between 30° 15'N and 28 °00'N, (approximately Sebastian Inlet, Florida) from the shoreline out to 5 nautical miles. The closure applies to the area annually from November 15 through April 15.

Note: Federal regulations would only apply to that portion of the area within the South Atlantic EEZ. The states will be asked to implement compatible regulations within state waters.

Note: This area represents North Atlantic right whale critical habitat in the South Atlantic region designated on June 3, 1994. The map below provides location of the critical habitat boundary. The critical habitat designation did not provide waypoints for the boundary. The boundary would not automatically change if the boundary for the right whale critical habitat were to change.

The following is language describing the North Atlantic right whale critical habitat area from 50 CFR 226:

> *Southeastern United States: The area designated as critical habitat in these waters encompasses waters between 31 deg.15'N (approximately located at the mouth of the Altamaha River, GA) and 30 deg.15'N (approximately Jacksonville, FL) from the shoreline out to 15 nautical miles offshore; and the waters between 30 deg.15'N and 28 deg.00'N (approximately Sebastian Inlet, FL) from the shoreline out to 5 nautical miles.*

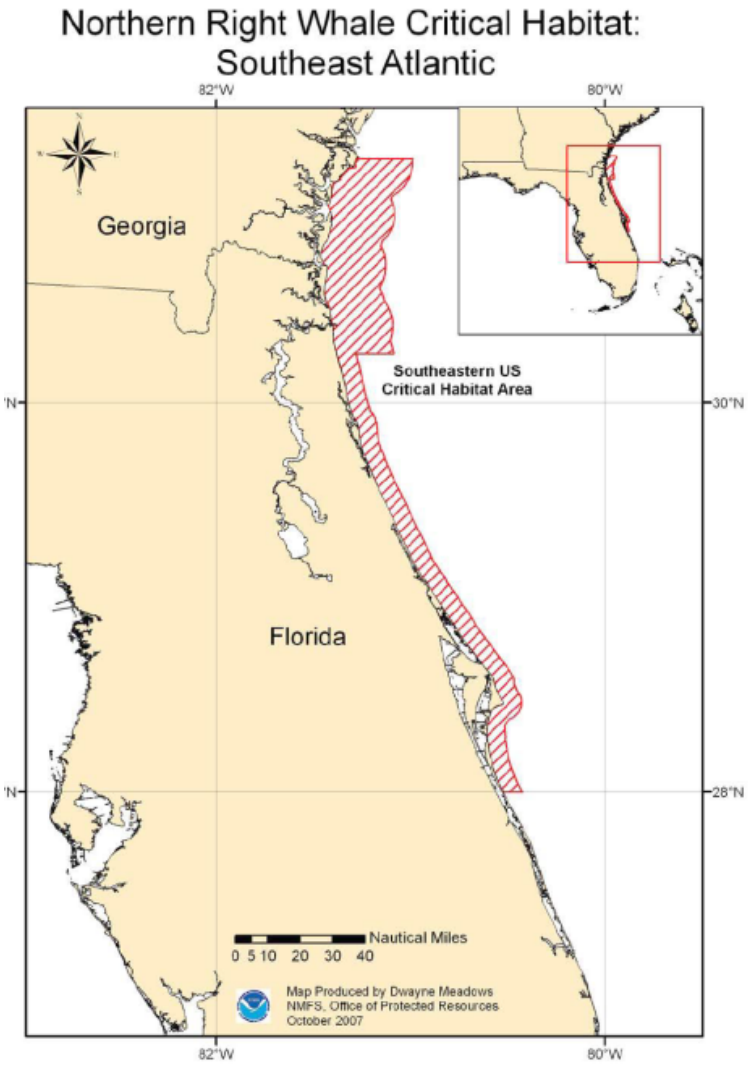

Figure 2.1.1. Area for the proposed black sea bass pot closure in **Alternative 2**.
Source:

Alternative 3. The black sea bass pot closure applies to waters inshore of points 1-15 listed below **(Table 2.1.1)**; approximately Ponce Inlet, Florida, to Cape Hatteras, North Carolina **(Figure 2.1.2)**. The closure applies to the area annually from November 1 through April 30.

Note: Federal regulations would only apply to that portion of the area within the South Atlantic EEZ. The states will be asked to implement compatible regulations within state waters.

Note: This area likely represents North Atlantic right whale calving habitat. The area identified from Cape Fear, North Carolina, southward to 29°N (approximately Ponce Inlet, Florida) is based on model outputs (i.e., Garrison 2007, Keller et al. 2012, Good 2008). The area from Cape Fear, North Carolina, to Cape Hatteras, North Carolina, is an extrapolation of those model outputs and based on sea surface temperatures and bathymetry.

Table 2.1.1. Eastern boundary coordinates for the proposed black sea bass pot closure in **Alternative 3**.

Point	N Latitude	W Longitude
1	35°15′ N	State/EEZ boundary
2	35°15’	75°12’
3	34°51’	75°45’
4	34°21’	76°18’
5	34°21’	76°45’
6	34°12’	77°21’
7	33°37’	77°47
8	33°28’	78°33
9	32°59’	78°50’
10	32°17’	79°53’
11	31°31’	80°33’
12	30°43’	80°49’
13	30°30’	81°01’
14	29°45’	81°01’
15	29°00’	State/EEZ boundary

Source:

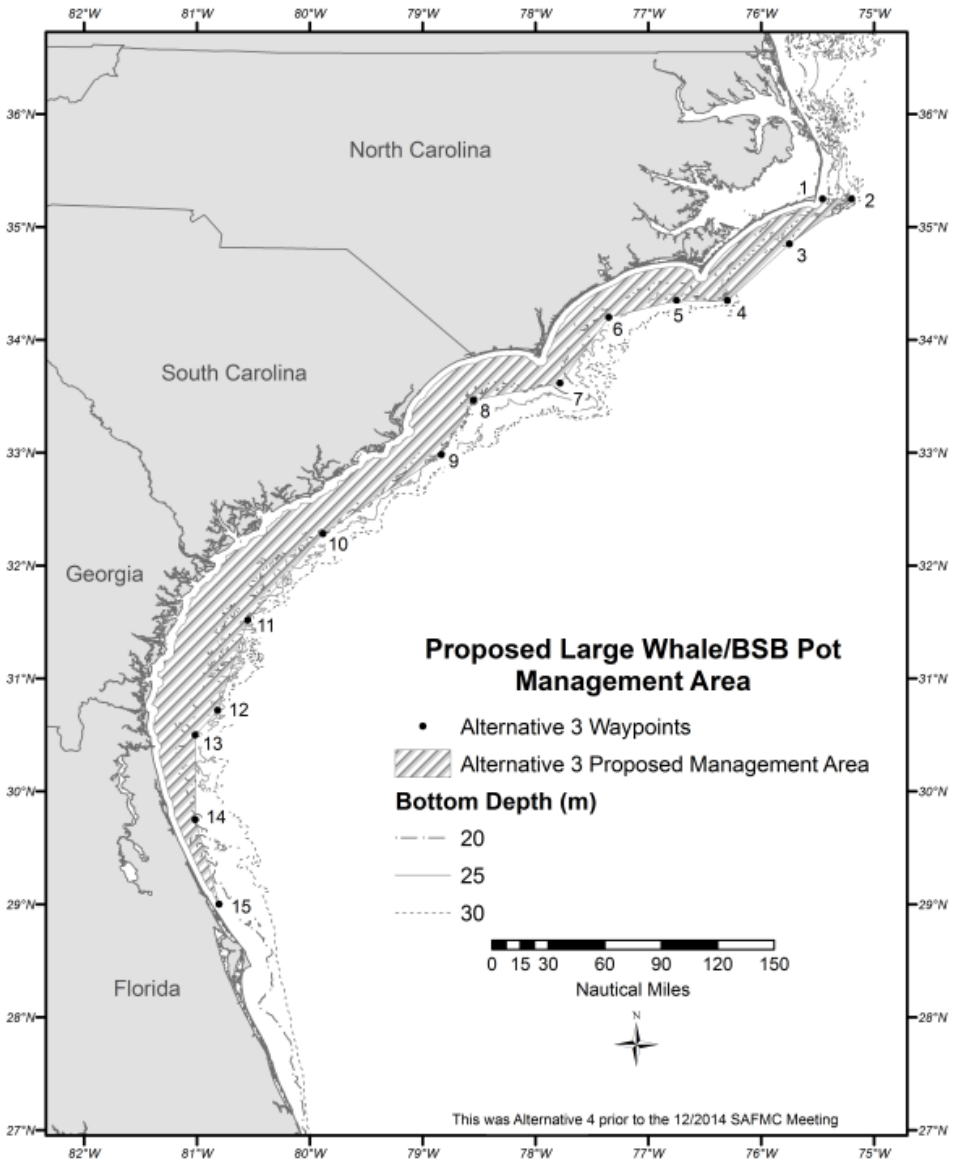

Figure 2.1.2. Area for the proposed black sea bass pot closure in **Alternative 3**.
Source:

Alternative 4. The black sea bass pot closure applies to waters inshore of points 1-28 listed below **(Table 2.1.2)**; approximately Cape Canaveral, Florida, to Cape Hatteras, North Carolina **(Figure 2.1.3)**. The closure applies to the area annually from November 1 through April 30.

Note: Federal regulations would only apply to that portion of the area within the South Atlantic EEZ. The states will be asked to implement compatible regulations within state waters.

Note: This area generally represents waters 25 m or shallower from 28° 21 N (approximately Cape Canaveral, Florida) to Savannah, Georgia; from the Georgia/South Carolina border to Cape Hatteras, North Carolina, the closure applies to waters under Council management that are 30 m or shallower. This bathymetric area is based on right whale sightings (all demographic segments) and sightings per unit of effort (proxy of density) by depth and captures 97% and 96% of right whale sightings off the North Carolina/South Carolina area, and Florida/Georgia area, respectively. The map below provides an approximate location of the proposed boundary.

Table 2.1.2. Eastern boundary coordinates for the proposed black sea bass pot closure in **Alternative 4**.

Point	N Latitude	W Longitude
1	35° 15’	State/EEZ boundary
2	35° 15’	75° 08’
3	34° 58’	75° 41’
4	34° 49’	75° 50’
5	34° 47’	76° 05’
6	34° 31’	76° 18’
7	34° 20’	76° 13
8	34° 12’	77° 00’
9	33° 43’	77° 30’
10	33° 21’	77° 21’
11	33° 18’	77° 41’
12	33° 22’	77° 56’
13	33° 12’	78° 20’
14	33° 05’	78° 22’
15	33° 01’	78° 38’
16	32° 40’	79° 01’
17	32° 36’	79° 18’
18	32° 19’	79° 22’
19	32° 16’	79° 37’
20	32° 03’	79° 48’
21	31° 39’	80° 27’
22	30° 58’	80° 47’
23	30° 13’	81° 01’
24	29° 32’	80° 39’
25	29° 22’	80° 44’
26	28° 50’	80° 22’

27	28° 21’	80° 18’
28	28° 21’	State/EEZ boundary

Source:

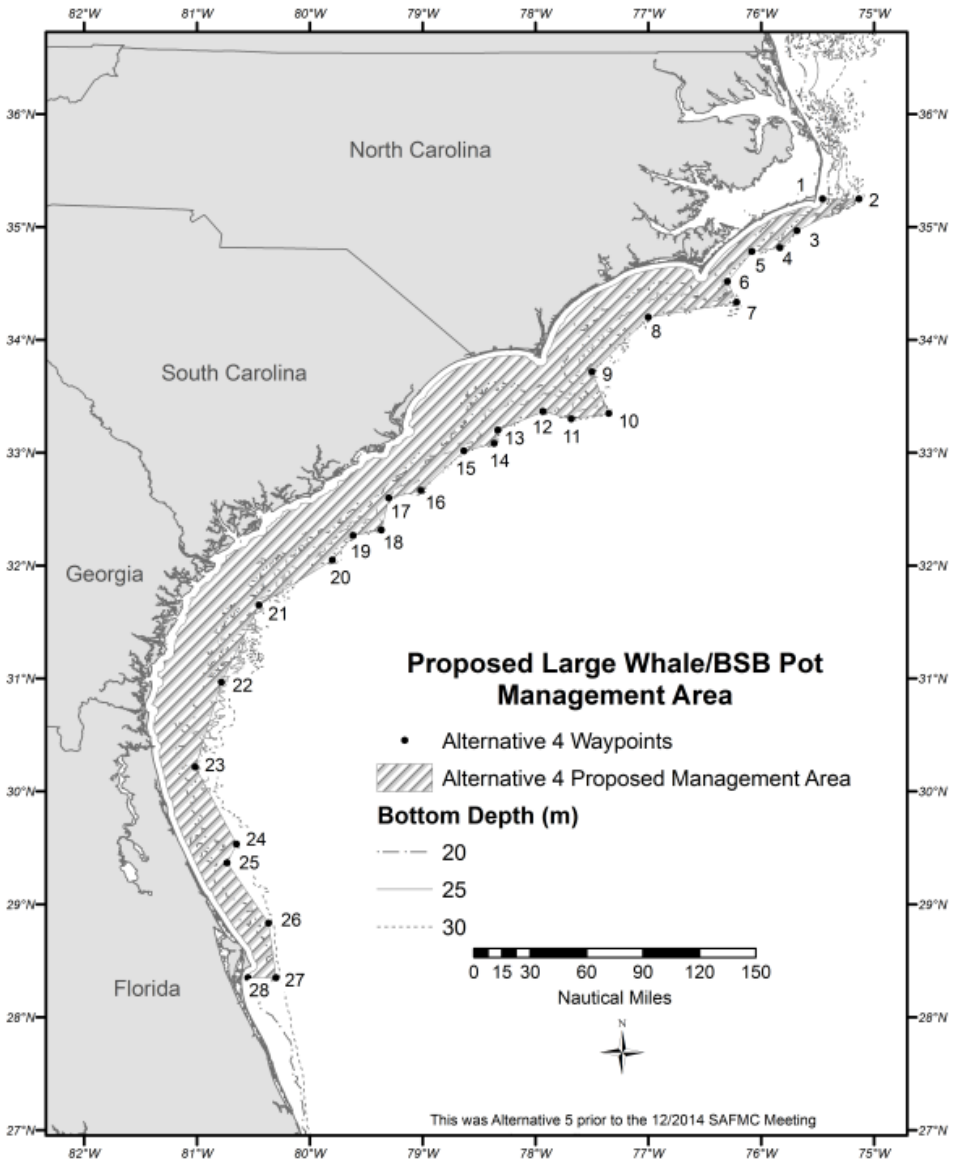

Figure 2.1.3. Area for the proposed black sea bass pot closure in **Alternative 4**.
Source:

Alternative 5. The black sea bass pot closure applies to waters inshore of points 1-28 listed below **(Table 2.1.3)**; approximately Daytona Beach, Florida, to Cape Hatteras, North Carolina **(Figure 2.1.4)**. The closure applies to the area annually from November 1 through April 30.

Comment [G2]: The Dec DD shows Cape Canaveral so we need to show this as a recommended change from the IPT

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Note: Federal regulations would only apply to that portion of the area within the South Atlantic EEZ. The states will be asked to implement compatible regulations within state waters.

Note: This area is based on joint comments received from non-government organizations (dated January 3, 2014) in response to NMFS' December 4, 2013, *Federal Register* Notice of Intent to Prepare this Draft Environmental Impact Statement (DEIS) (78 FR 72868). The non-government organizations proposed the area as a reasonable alternative for consideration. The area, also included in a Center for Biological Diversity et al. petition in 2009 for right whale critical habitat, is off the coasts of Georgia and Florida and based on calving right whale habitat modeling work of Garrison (2007) and Keller et al. (2012). This area represents the 75th percentile of sightings (91% of historical sightings included in their study) off Florida and Georgia (Garrison 2007 and Keller et al. 2012). Off the coasts of North Carolina and South Carolina, the closure extends from the coastline to 30 nautical miles offshore. The map below provides approximate location of proposed boundary.

Table 2.1.3. Eastern boundary coordinates for the proposed black sea Bass pot closure in **Alternative 5**.

Point	N Latitude	W Longitude
1	35°15'	State/EEZ Boundary
2	35°15'	74°54'
3	35°03'	74°57'
4	34°51'	75°06'
5	34°45'	75°18'
6	34°43'	75°33'
7	34°26'	75°57'
8	34°12'	76°07'
9	34°04'	76°26'
10	34°05'	76°41'
11	34°10'	76°55'
12	33°58'	77°16'
13	33°41'	77°23'
14	33°28'	77°32'
15	33°21'	77°45'
16	33°19'	78°02'
17	33°24'	78°17'
18	33°14'	78°33'
19	32°55'	78°39'

20	32°39’	78°56’
21	31°42’	80°24’
22	31°31’	80°33’
23	30°43’	80°49’
24	30°30’	81°01’
25	29°45’	81°01’
26	29°31’	80°58’
27	29°13’	80°52’
28	29°13’	State/EEZ boundary

Source:

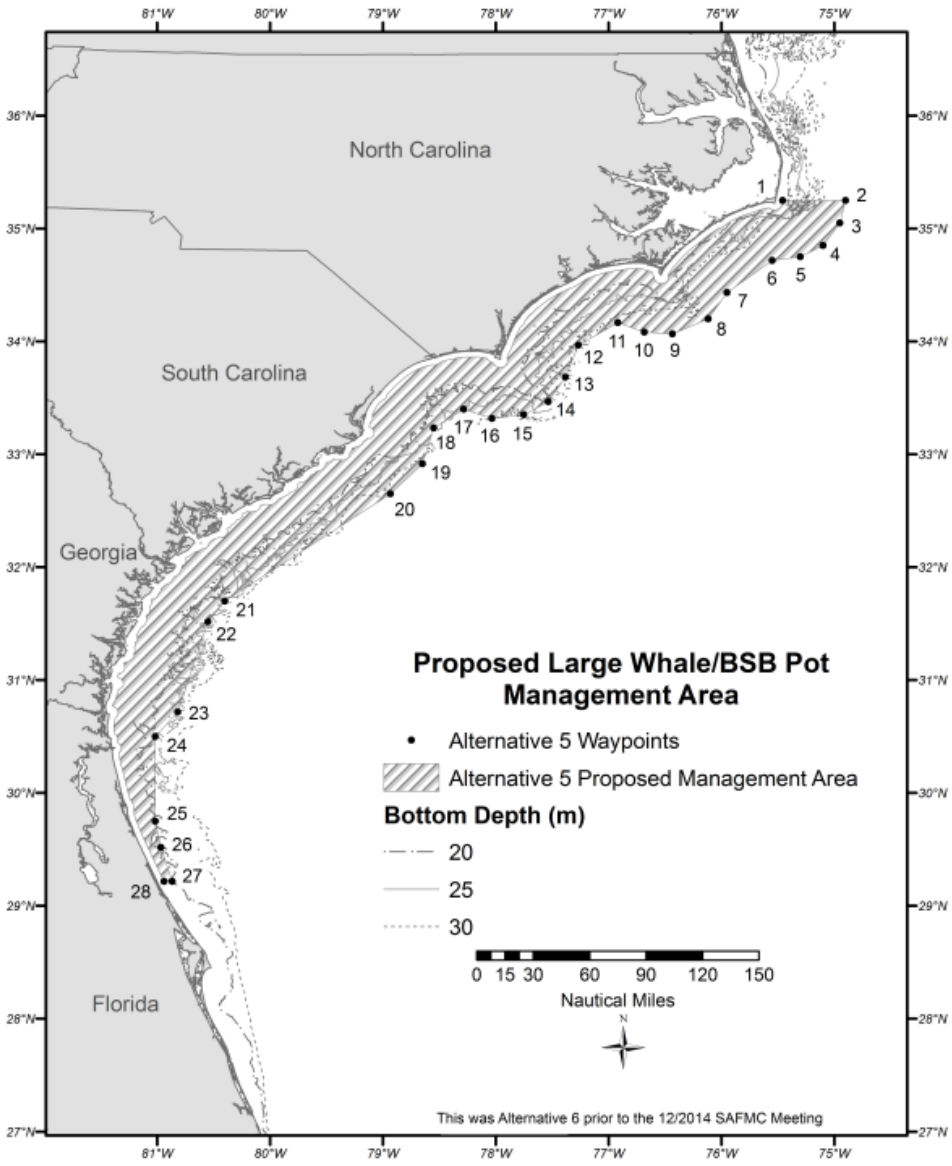

Figure 2.1.4. Area for the proposed black sea bass pot closure in **Alternative 5**.
Source:

Alternative 6. The black sea bass pot closure applies to waters inshore of points 1-20 listed below **(Table 2.1.4)**; approximately Sebastian, Florida, to Cape Hatteras, North Carolina. The closure applies to the area annually from November 1 through April 30.

Note: Federal regulations would only apply to that portion of the area within the South Atlantic EEZ. The states will be asked to implement compatible regulations within state waters.

Note: This area is also based on joint comments received from a number of environmental groups (dated January 3, 2014) in response to NMFS' December 4, 2013, *Federal Register* Notice of Intent to Prepare this DEIS (78 FR 72868). The environmental groups proposed the area as a reasonable alternative for consideration. This area represents an existing management area, the Southeast Seasonal Gillnet Restricted Area, under the Atlantic Large Whale Take Reduction Plan; and an additional area off North Carolina. The area off North Carolina includes waters shallower than 30 meters and is northward of the designated ALWTRP Southeast Restricted Area.

Table 2.1.4. Eastern boundary coordinates for the proposed black sea bass pot closure in **Alternative 6**.

Point	N. Latitude	W Longitude
1	35º ’15’	State/EEZ Boundary
2	35º ’15’	75º 08’
3	34º 58’	75º 41’
4	34º 49’	75º 50’
5	34º 47’	76º 05’
6	34º 31’	76º 18’
7	34º 20’	76º 13’
8	34º 12’	77º 00’
9	33º 43’	77º 30’
10	33º 21’	77º 21’
11	33º 18’	77º 41’
12	33º ’22’	77º ’56’
13	33º 19’	78º 06’
14	32º 58’	78º 39’
15	32º 39’	78º 59’
16	32º 37’	79º 14’
17	32º 22’	79º 22’
18	32º 00’	80º 00’
19	27º 51’	80º 00’
20	27º 51’	State/EEZ Boundary

Source:

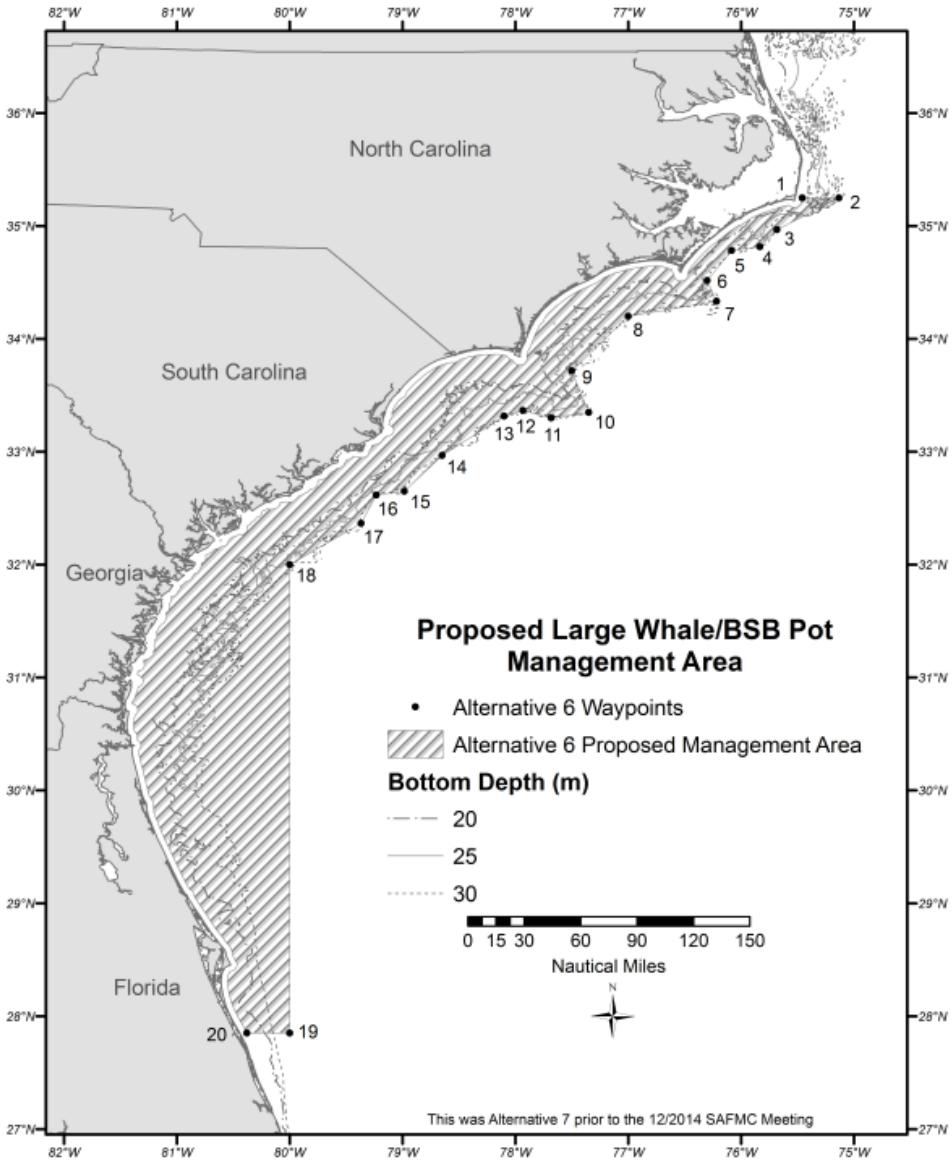

Figure 2.1.5. Area for the proposed black sea bass pot closure in **Alternative 6**.
Source:

Alternative 7. The black sea bass pot closure applies to the area currently designated as North Atlantic right whale critical habitat, in addition to waters inshore of points 1-29 listed below **(Table 2.1.5)**; approximately North of the Altamaha River, Georgia, to Cape Hatteras, North Carolina **(Figure 2.1.6)**.

Sub-alternative 7a. The black sea bass pot closure applies to the area annually from November 1 through December 15 and March 15 through April 30.

Sub-alternative 7b. For the area off North Carolina and South Carolina, the black sea bass pot closure applies annually from November 1 through December 15 and March 15 through April 30. For the area off Georgia and Florida, the black sea bass pot closure applies annually from November 15 through April 15.

Sub-alternative 7c. For the area off North Carolina and South Carolina, the black sea bass pot closure applies annually from February 15 through April 30. For the area off Georgia and Florida, the black sea bass pot closure applies annually from November 15 through April 15.

The IPT recommends that the alternative designated as **Alternative 8** by the Council become **sub-alternative 7c**; the differences between these sub-alternatives are based on the time periods that the closures are in place. To make alternative numbering consistent in this document, subsequent alternative numbering throughout the document reflects this change.

Note: Federal regulations would only apply to that portion of the area within the South Atlantic EEZ. The states will be asked to implement compatible regulations for the portion of the area within state waters.

Note: This area represents North Atlantic right whale critical habitat in the South Atlantic region designated on June 3, 1994. Off North Carolina and South Carolina, the black sea bass pot closure applies in the exclusive economic zone in waters shallower than 25 meters. The eastern boundary of the closure between these two areas was formed by drawing a straight line from the southeastern corner waypoint of the northern portion (NC/SC) to the northeastern corner waypoint of the southern section (FL/GA).

The wording of **Alternative 8** as recommended by the IPT in the Decision Document for the December 2014 Council meeting contained "25 meters" in the note. The Council's motion at the December 2014 meeting was to approve the IPT's recommended changes. The motion also contained the alternative with the changes incorporated but contained "20 meters" instead of "25 meters". Council staff researched the SG Committee and Full Council minutes to see if the depth was changed in either place. There were discussions of 20 vs. 25 meters and about the notes. But Council staff did not uncover anything that changed the depth contour from 25 to 20 meters in a motion, and Council staff concluded that the depth was most likely changed through a copy and paste error. Council should clarify at the March 2015 meeting.

The following is language describing the North Atlantic right whale critical habitat area from 50

CFR 226:

Southeastern United States: The area designated as critical habitat in these waters encompasses waters between 31 deg.15'N (approximately located at the mouth of the Altamaha River, GA) and 30 deg.15'N (approximately Jacksonville, FL) from the shoreline out to 15 nautical miles offshore; and the waters between 30 deg.15'N and 28 deg.00'N (approximately Sebastian Inlet, FL) from the shoreline out to 5 nautical miles.

Table 2.1.5. Eastern boundary coordinates for the proposed black sea bass pot closure in **Alternative 7**.

Point	N. Latitude	W Longitude
1	35° 15'	'State/EEZ boundary
2	35° 15'	75° 09'
3	35° 06'	75° 22'
4	35° 06'	75° 39'
5	35° 01'	75° 47'
6	34° 54'	75° 46'
7	34° 52'	76° 04'
8	34° 33'	76° 22'
9	34° 23'	76° 18'
10	34° 21'	76° 27'
11	34° 25'	76° 51'
12	34° 09'	77° 19'
13	33° 44'	77° 38'
14	33° 25'	77° 27'
15	33° 22'	77° 40'
16	33° 28'	77° 41'
17	33° 32'	77° 53'
18	33° 22'	78° 26'
19	33° 06'	78° 31'
20	33° 05'	78° 40'
21	33° 01'	78° 43'
22	32° 56'	78° 57'
23	32° 44'	79° 04'
24	32° 42'	79° 13'
25	32° 34'	79° 23'
26	32° 25'	79° 25'
27	32° 23'	79° 37'

28	31° 53’	80° 09’
29	31° 15’	80° 59’
30	30° 56’	81° 05’
31	30° 42’	81° 07’
32	30° 15’	81° 05’
33	30° 15’	81° 17’
34	29° 40’	81° 07’
35	29° 08’	80° 51’
36	28° 36’	80° 28’
37	28° 26’	80° 25’
38	28° 20’	80° 31’
39	28° 11’	80° 30’
40	28° 00’	80° 25’
41	28° 00’	’State/EEZ Boundary

Source:

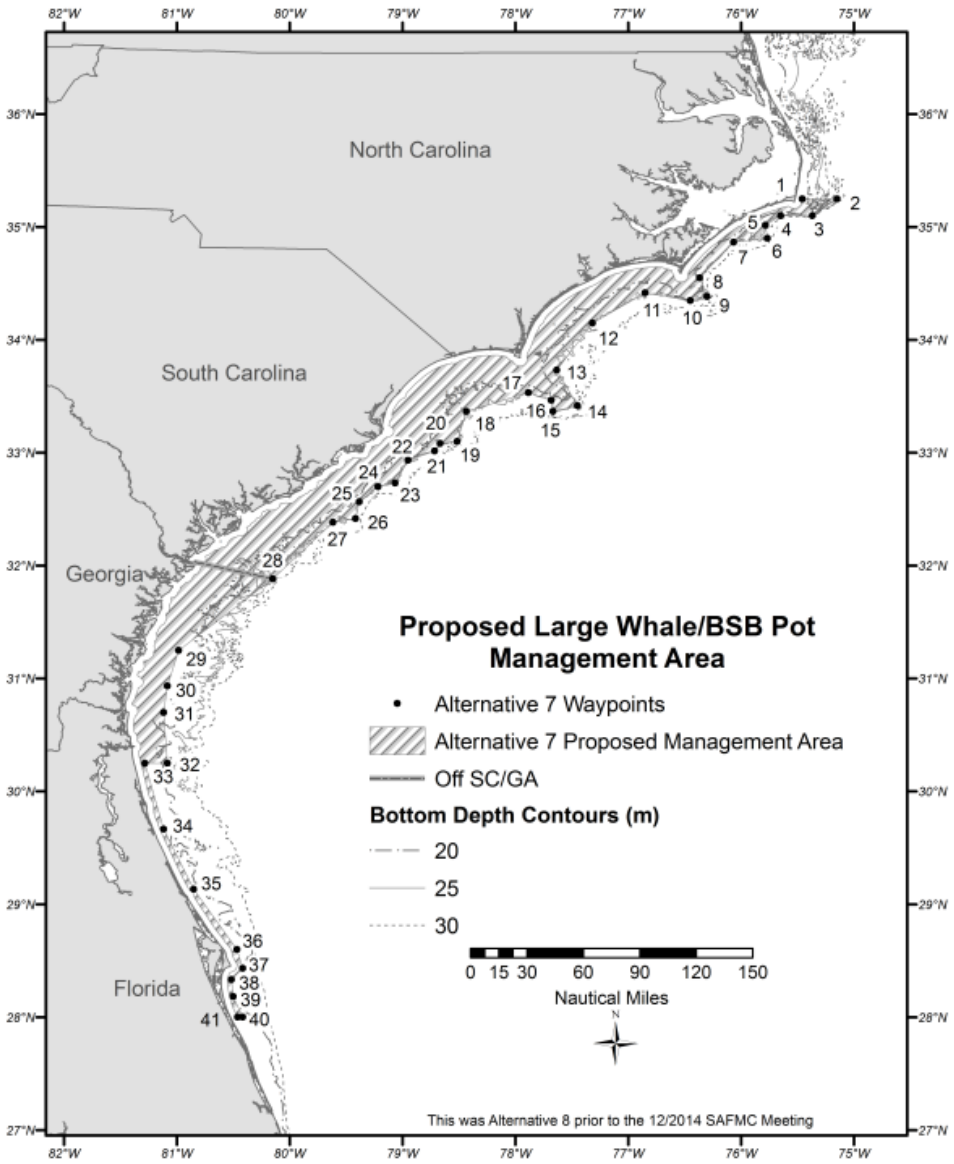

Figure 2.1.6. Area for the proposed black sea bass pot closure in **Alternative 7**.
Source:

~~**NEW Alternative 8.** The black sea bass pot closure applies to the area currently designated as North Atlantic right whale critical habitat, in addition to waters inshore of points 1-29 listed below (Table 2.1.6), approximately North of the Altamaha River, Georgia, to Cape Hatteras, North Carolina (Figure 2.1.7). For the area off North Carolina and South Carolina, the black sea bass pot closure applies annually from February 15 through April 30. For the area off Georgia and Florida, the black sea bass pot closure applies annually from November 15 through April 15.~~

~~Note: Federal regulations would only apply to that portion of the area within the South Atlantic EEZ. The states will be asked to implement compatible regulations for the portion of the area within state waters.~~

~~Note: This area represents North Atlantic right whale critical habitat in the South Atlantic region designated on June 3, 1994. Off North Carolina and South Carolina, the black sea bass pot closure applies in the exclusive economic zone in waters shallower than 20 meters. The eastern boundary of the closure between these two areas was formed by drawing a straight line from the southeastern corner waypoint of the northern portion (NC/SC) to the northeastern corner waypoint of the southern section (FL/GA).~~

The IPT recommends that the alternative designated as **Alternative 8** by the Council become **sub-alternative 7c**; the differences between these sub-alternatives are based on the time periods that the closures are in place. To make alternative numbering consistent in this document, subsequent alternative numbering throughout the document reflects this change.

Alternative 8 . The black sea bass pot closure applies to waters inshore of points 1-35 listed below **(Table 2.1.6)**; ~~basically~~ approximately Daytona Beach, Florida, to Cape Hatteras, North Carolina **(Figure 2.1.7)**.

Sub-alternative 8a. The black sea bass pot closure applies to the area annually from November 1 through April 15.

Sub-alternative 8b. For the area off North Carolina and South Carolina, the black sea bass pot closure applies annually from November 1 through December 15 and February 15 through April 30. For the area off Georgia and Florida, the black sea bass pot closure applies annually from November 15 through April 15.

Note: Federal regulations would only apply to that portion of the area within the South Atlantic EEZ. The states will be asked to implement compatible regulations for the portion of the area within state waters.

Note: In **Alternative 8**, the boundaries off Florida and Georgia are identical to the boundaries in **Alternative 5**. Off North Carolina and South Carolina, the black sea bass pot closure applies in the exclusive economic zone in waters shallower than 25 meters.

Points 1-28 in the table below were in the Council's motion and were taken from **Table 2.1.5**. However, **Alternative 7** is based on 20 meters where **Alternative 8** is based on 25 meters. The Council needs to clarify whether **Alternative 8** should be based on 20 meters or the points in the table should be revised to reflect a boundary at 25 meters.

Table 2.1.6. Eastern boundary coordinates for the proposed black sea bass pot closure in **Alternative 8**.

Comment [G3]: Add source at bottom of table

Point	N. Latitude	W Longitude
1	35° 15'	'State/EEZ Boundary
2	35° 15'	75° 09'
3	35° 06'	75° 22'
4	35° 06'	75° 39'
5	35° 01'	75° 47'
6	34° 54'	75° 46'
7	34° 52'	76° 04'
8	34° 33'	76° 22'
9	34° 23'	76° 18'
10	34° 21'	76° 27'
11	34° 25'	76° 51'
12	34° 09'	77° 19'
13	33° 44'	77° 38'
14	33° 25'	77° 27'
15	33° 22'	77° 40'
16	33° 28'	77° 41'
17	33° 32'	77° 53'
18	33° 22'	78° 26'
19	33° 06'	78° 31'

20	33° 05’	78° 40’
21	33° 01’	78° 43’
22	32° 56’	78° 57’
23	32° 44’	79° 04’
24	32° 42’	79° 13’
25	32° 34’	79° 23’
26	32° 25’	79° 25’
27	32° 23’	79° 37
28	31° 53’	80° 09’
29	31º 31’	80º 33’
30	30º 43’	80º 49’
31	30º 30’	81º 01’
32	29º 45’	81º 01’
33	29º 31’	80º 58’
34	29º 13’	80º 52’
35	29º 13’	State/EEZ Boundary

Source:

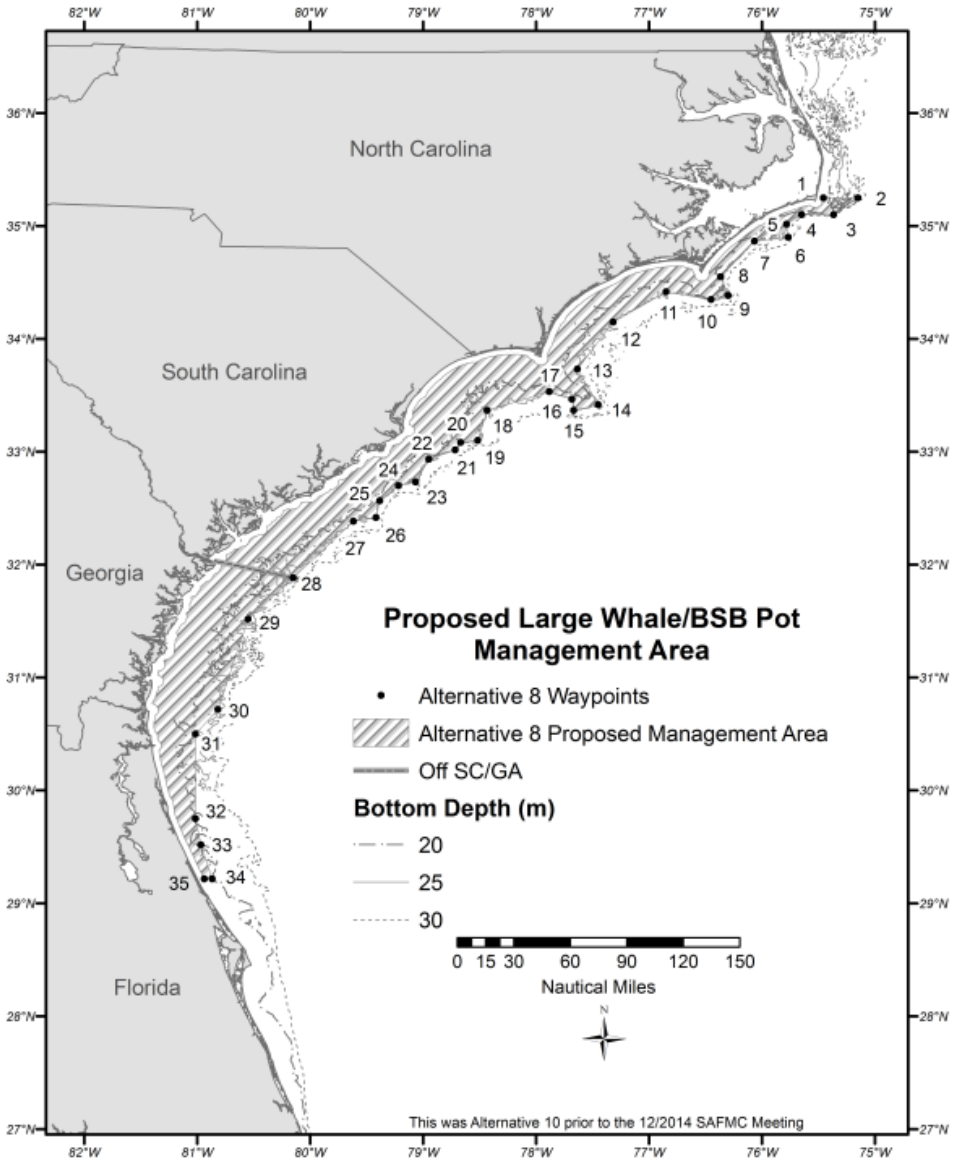

Figure 2.1.7. Area for the proposed black sea bass pot closure in **Alternative 8**.
Source:

Alternative 9. The black sea bass pot closure applies to waters inshore of points 1-18 listed below **(Table 2.1.7)**; ~~basically~~ approximately Daytona Beach, Florida, to Cape Hatteras, North Carolina **(Figure 2.1.8)**.

> **Sub-alternative 9a.** The black sea bass pot closure applies to the area annually from November 1 through April 15.
>
> **Sub-alternative 9b.** For the area off North Carolina and South Carolina, the black sea bass pot closure applies annually from November 1 through December 15 and February 15 through April 30. For the area off Georgia and Florida, the black sea bass pot closure applies annually from November 15 through April 15.

The IPT recommends that the last sentence in the sub-alternative above be moved to create **Alternative 10** for clarification purposes. This alternative would consider changing spatial boundaries at different times of the year.

Note: Federal regulations would only apply to that portion of the area within the South Atlantic EEZ. The states will be asked to implement compatible regulations for the portion of the area within state waters.

Note: In **Alternative 9**, the boundaries off Florida and Georgia are identical to the boundaries in **Alternative 5**. Off North Carolina and South Carolina, the black sea bass pot closure applies in the exclusive economic zone in waters shallower than 20 meters.

Table 2.1.7. Eastern boundary coordinates for the proposed black sea bass pot closure in **Alternative 9**.

Point	N. Latitude	W Longitude
1	35° 15′	State/EEZ Boundary
2	35° 15’	75° ’20’
3	35° 05’’	75° ’24’
4	35° 08’’	’75° 38’
5	35° 04’’	’75° 52’
6	34° ’51’	’76° 11’
7	34° 36’’	76° 24’
8	34° 24’’	76° 19’
9	34° 21’’	’76° 27’
10	34° 33’’	’76° 48’
11	34° 16’	77° 25’
12	33° 44’	77° 46’
13	33° 30’	77° 31’
14	33° 28’	77° 35’
15	33° 36’	77° 55’
16	33° 34’	78° 28’
17	32° 59’	78° 52’
18	32° 59’	79° 02’
19	32° 31’	79° 30’
20	31° 57’	80° 27’
11	31° ’42’	80° ’24’
12	31º 31’	80º 33’
13	30º 43’	80º 49’
14	30º 30’	81º 01’
15	29º 45’	81º 01’
16	29º 31’	80º 58’
17	29º 13’	80º 52’
18	29º 13’	State/EEZ Boundary

Source:

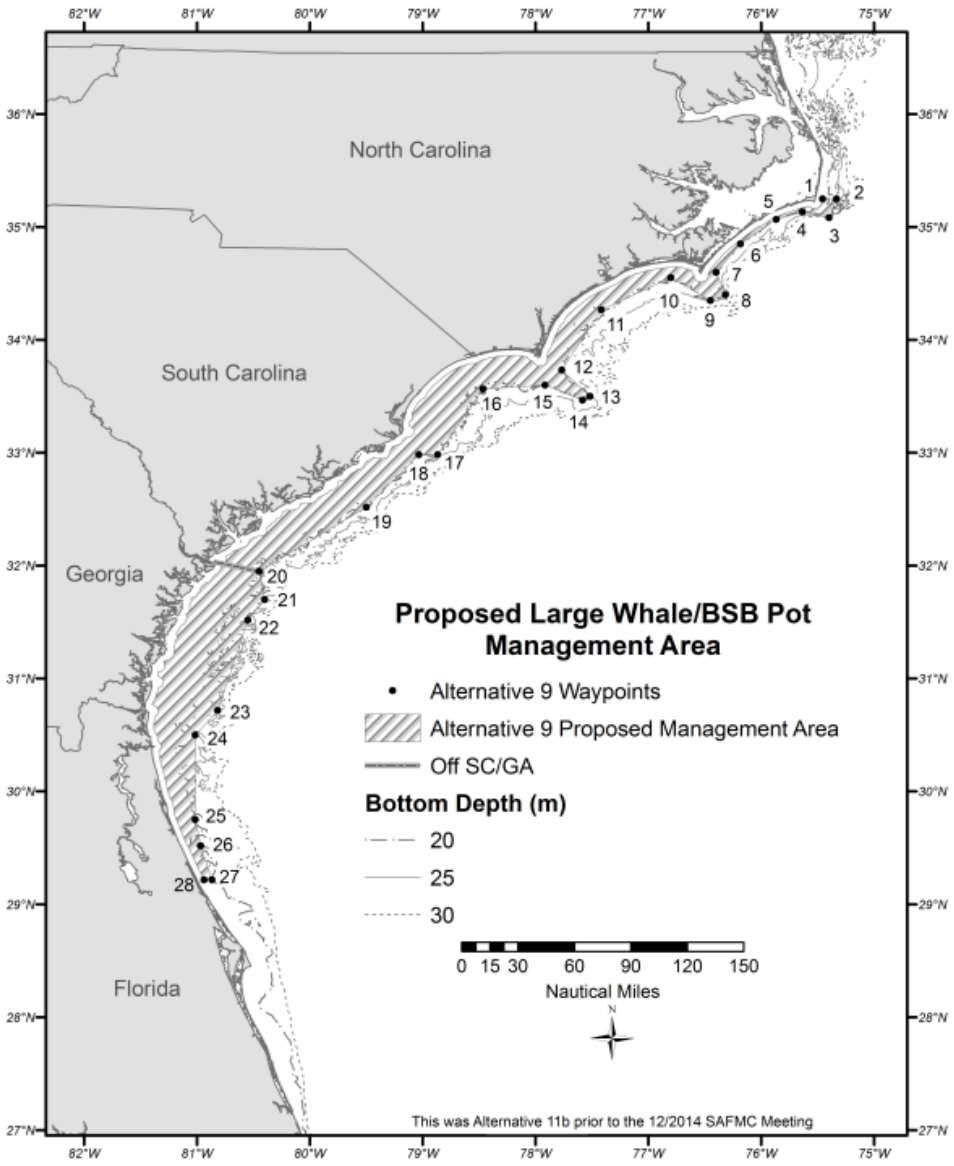

Figure 2.1.8. Area for the proposed black sea bass pot closure in **Alternative 9**.

Source:

The Council made a motion to add the following statement to sub-alternative 11b: **"**Off FL/GA the closure would apply to waters shallower than 20 meters in the fall and shallower than 25 meters in the spring". For clarification purposes, the IPT recommends the addition of a new alternative (below) rather than a modification to the sub-alternative in the previous alternative.

Alternative 10. From November 1 through December 15, the black sea bass pot closure applies to waters inshore of points 1-20 listed below **(Table 2.1.8)**, approximately Georgia/South Carolina State Line, to Cape Hatteras, North Carolina **(Figure 2.1.9).**

From February 15 through April 30, the black sea bass pot closure applies to waters inshore of points 1-28 listed below **(Table 2.1.9)**, approximately Georgia/South Carolina State Line, to Cape Hatteras, North Carolina **(Figure 2.1.10).**

From December 16 through February 14, there would be no closure off of the Carolinas.

From November 15 through April 15, the black sea bass pot closure applies to waters inshore of points 20-28 listed below **(Table 2.1.8)**, approximately Georgia/South Carolina State Line, to approximately Daytona Beach, Florida **(Figure 2.1.9).**

Note: In **Alternative 10**, the boundaries off Florida and Georgia are identical to the boundaries in **Alternative 5**. Off North Carolina and South Carolina, the black sea bass pot closure applies in the exclusive economic zone in waters shallower than 20 meters from November 1 through December 15 and 25 meters from February 15 through April 30.

Table 2.1.8. Eastern boundary coordinates for the proposed black sea bass pot closure in **Alternative 10** for November 1 through x.

Point	N. Latitude	W Longitude
1	35° 15′	State/EEZ Boundary
2	35° 15'	75° '20'
3	35° 05''	75° '24'
4	35° 08''	'75° 38'
5	35° 04''	'75° 52'
6	34° '51'	'76° 11'
7	34° 36''	76° 24'
8	34° 24''	76° 19'
9	34° 21''	'76° 27'
10	34° 33''	'76° 48'
11	34° 16'	77° 25'
12	33° 44'	77° 46'
13	33° 30'	77° 31'
14	33° 28'	77° 35'
15	33° 36'	77° 55'
16	33° 34'	78° 28'
17	32° 59'	78° 52'
18	32° 59'	79° 02'

19	32° 31’	79° 30’
20	31° 57’	80° 27’
11	31° ’42’	80° ’24’
12	31º 31’	80º 33’
13	30º 43’	80º 49’
14	30º 30’	81º 01’
15	29º 45’	81º 01’
16	29º 31’	80º 58’
17	29º 13’	80º 52’
18	29º 13’	State/EEZ Boundary

Source:

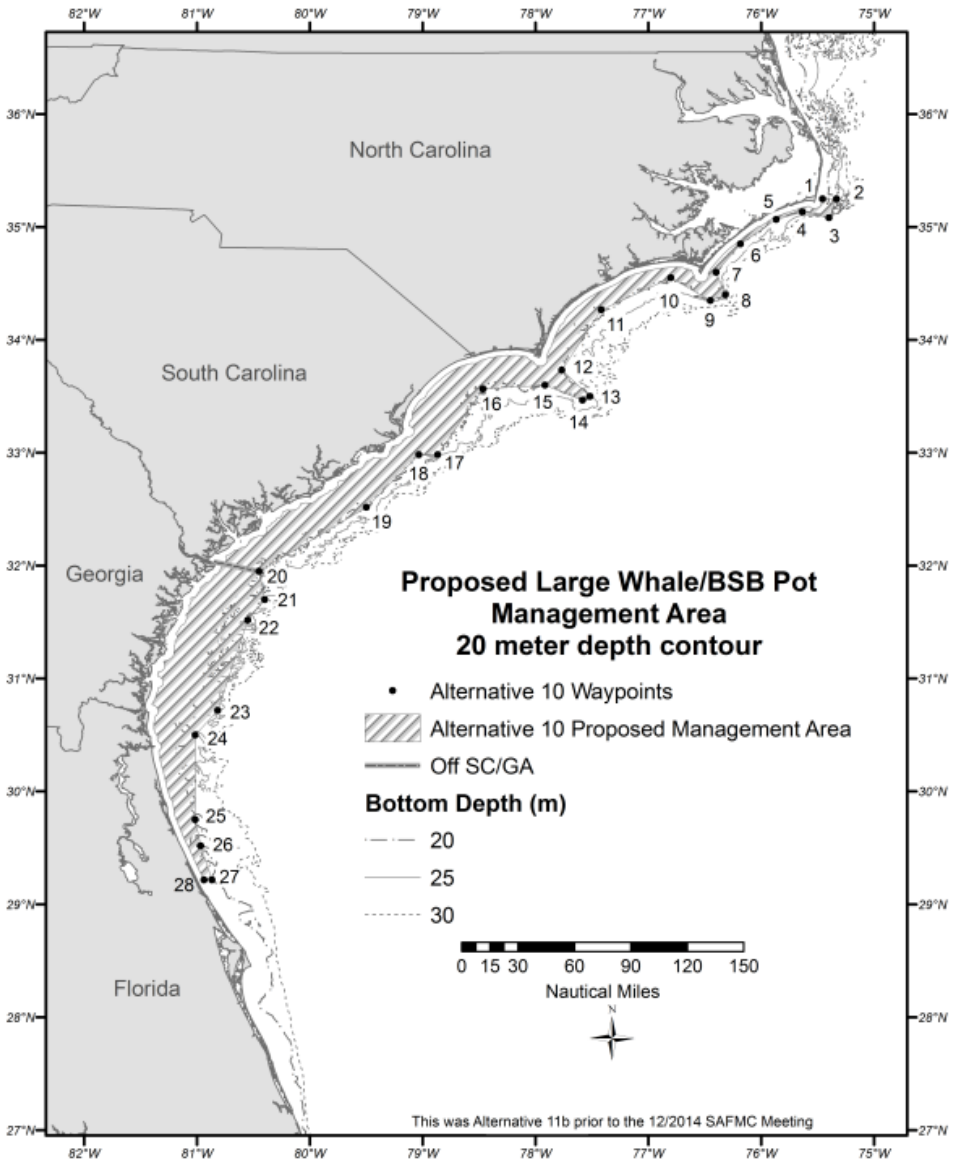

Figure 2.1.9. Area for the proposed black sea bass pot closure in **Alternative 10** from November 1 through December 15.
Source:

Table 2.1.9. Eastern boundary coordinates for the proposed black sea bass pot closure in **Alternative 10** for x through April 30.

Point	N. Latitude	W Longitude
1	35° 15’	’State/EEZ Boundary
2	35° 15’	75° 09’
3	35° 06’	75° 22’
4	35° 06’	75° 39’
5	35° 01’	75° 47’
6	34° 54’	75° 46’
7	34° 52’	76° 04’
8	34° 33’	76° 22’
9	34° 23’	76° 18’
10	34° 21’	76° 27’
11	34° 25’	76° 51’
12	34° 09’	77° 19’
13	33° 44’	77° 38’
14	33° 25’	77° 27’
15	33° 22’	77° 40’
16	33° 28’	77° 41’
17	33° 32’	77° 53’
18	33° 22’	78° 26’
19	33° 06’	78° 31’
20	33° 05’	78° 40’
21	33° 01’	78° 43’
22	32° 56’	78° 57’
23	32° 44’	79° 04’
24	32° 42’	79° 13’
25	32° 34’	79° 23’
26	32° 25’	79° 25’
27	32° 23’	79° 37
28	31° 53’	80° 09’
29	31º 31’	80º 33’
30	30º 43’	80º 49’
31	30º 30’	81º 01’
32	29º 45’	81º 01’
33	29º 31’	80º 58’
34	29º 13’	80º 52’
35	29º 13’	State/EEZ Boundary

Source:

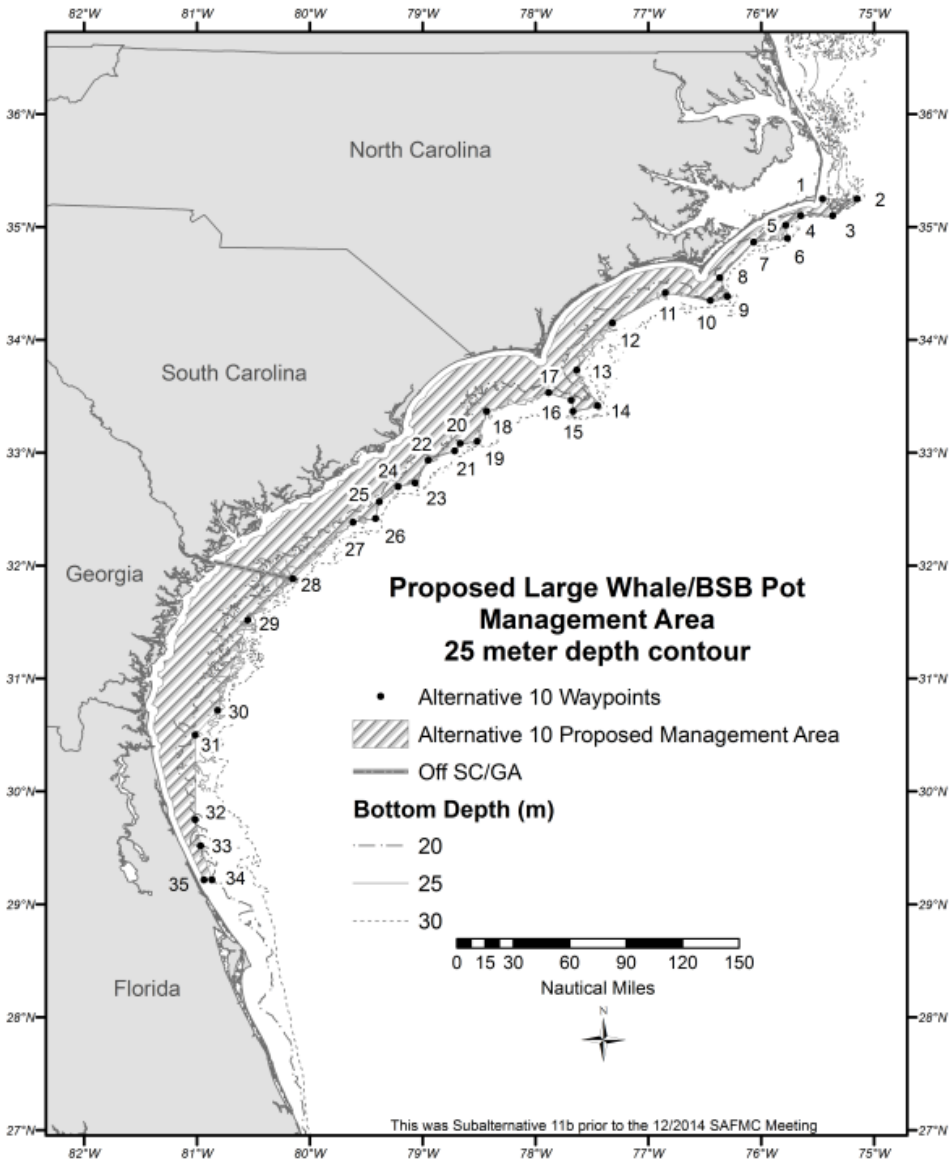

Figure 2.1.10. Area for the proposed black sea bass pot closure in **Alternative 10** from February 15 through April 30.
Source:

Action 2. Modify the existing buoy line/weak link gear requirements and buoy line rope marking for black sea bass pots

An IPT member recommends changing "modify" to "enhance" in the action title for clarification purposes.

Alternative 1 (No Action). Retain the existing buoy line and weak link gear requirements for black sea bass pots as required by the Atlantic Large Whale Take Reduction Plan. From November 15 through April 15, the breaking strength of the buoy lines must not exceed 2,200 lbs in federal waters off Florida, Georgia, and South Carolina. The breaking strength of the weak links must not exceed 600 lbs in federal waters off Florida, Georgia, and South Carolina.

Retain the existing rope marking requirements for the buoy line for black sea bass pots as required by the Atlantic Large Whale Take Reduction Plan. The buoy line rope must be marked at least three times (top, middle, and bottom) and each mark must total 12-inch in length. During certain times of the year, the buoy line rope marking must be green and orange for federal waters within the Southeast Restricted Area North (Nov. 15-April 15), black for the Offshore Trap/Pot Area (Sept. 1-May 31), and orange for the Southern Nearshore Trap/Pot Waters Area (Sept. 1-May 31) **(Figure 2.1.11)**.

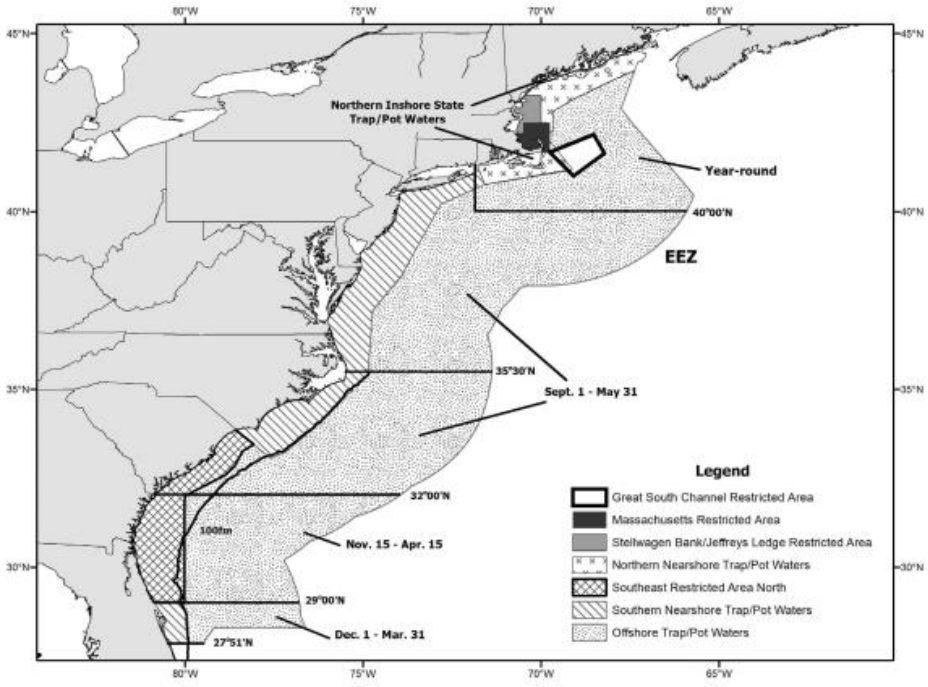

Figure 2.1.11. The trap/pot management areas in the South Atlantic developed through the Atlantic Large Whale Take Reduction Plan.
Source:

Alternative 2. Retain Atlantic Large Whale Take Reduction Plan gear restrictions and requirements. In addition, ~~S~~specify a buoy line strength ~~less than or equal to~~where the breaking strength must not exceed 2,200 lbs in federal waters off North Carolina and ~~a weak link~~the breaking strength of the weak links must not exceed ~~less than or equal to~~ 400 lbs for black sea bass pots in the ~~S~~south ~~A~~atlantic EEZ (waters adjacent to Florida, Georgia, South Carolina, and North Carolina).

Alternative 3. Retain Atlantic Large Whale Take Reduction Plan gear restrictions and requirements. In addition to the Plan's gear marking requirements, ~~Existing trap/pot buoy line marking requirements established in the Atlantic Large Whale Take Reduction Plan will be supplemented to~~ include a ~~distinguishing~~ feature specifically distinguishing ~~linked to~~ the South Atlantic black sea bass pot fishery. In addition to the 3 12-inch color marks at the top, midway, and bottom sections of the buoy line specified for the individual management area ~~-~~in which the gear is deployed as required by the Atlantic Large Whale

Take Reduction Plan, a ~~2~~ 2-inch wide colored band will be added at the ~~center~~ end of each required 12-inch colored mark. Total mark would be 14 inches in length.

Council needs to specify color of 2-inch wide band.

Is the distinguishing marking year round or seasonal?

Chapter 3. Affected Environment

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

Affected Environment

- **Habitat environment (Section 3.1)**

  Examples include coral reefs and sea grass beds

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

  Examples include populations of red snapper, corals, turtles

- **Human environment (Section 3.3)**

  Examples include fishing communities and economic descriptions of the fisheries

- **Administrative environment (Section 3.4)**

  Examples include the fishery management process and enforcement activities

3.1 Habitat Environment

3.1.1 Inshore/Estuarine Habitat

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

3.1.2 Offshore Habitat

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

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

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

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

The distribution of coral and live hard bottom habitat as presented in the Southeast Area Monitoring, Assessment, and Prediction Program (SEAMAP) bottom mapping project is a proxy for the distribution of the species within the snapper grouper complex. The method used to

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

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

3.1.3 Essential Fish Habitat

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

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

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

3.1.4 Habitat Areas of Particular Concern

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

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

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

3.2 Biological and Ecological Environment

3.2.1 Fish Stocks

3.2.1.1 Black Sea Bass, *Centropristis striata*

Life History

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

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

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

Descriptions of other South Atlantic Council-managed species may be found in Volume II of the Fishery Ecosystem Plan (SAFMC 2009b) or at the following web address: http://www.safmc.net/ecosystem/Home/EcosystemHome/tabid/435/Default.aspx.

Biomass and Landings

The following description of the biomass of black sea bass is from the SEDAR 25 Update report: In general, estimated abundance at age showed truncation of the older ages through the mid-1990s, and more stable or increasing values since. Total estimated abundance at the end of the assessment period showed some general increase from a low in 1999. In the most recent decade, a notably strong year class (age-0 fish) was predicted to have occurred in 2001 and 2010, and better than expected recruitment (i.e., positive residuals) from 2006 to 2011. Estimated biomass at age followed a similar pattern as abundance at age. Total biomass and spawning biomass showed similar trends – general decline from early 1980s until the mid-1990s, a relatively stable period from 1993-2006, and a steadily increasing since 2007 (**Figure 3.2.1**).

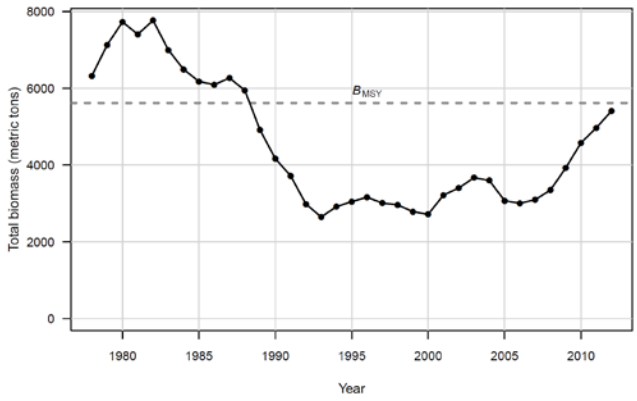

Figure 3.2.1. Estimated total biomass (metric tons) at start of year (SEDAR 25 Update 2013).

Stock Status

An update to the black sea bass assessment was conducted in 2013 with data through 2012. Most of the data sources were simply updated with the 2 additional years of observations available since SEDAR 25 (2011) benchmark assessment that contained data through 2010. Additional changes made in some sources, such as recreational catch records, indices, and discards are detailed below. In addition, some datasets were unable to be updated due to management actions, regulations, and data availability issues.

Substantial changes are underway in recreational harvest surveys with implementation of the Marine Recreational Information Program (MRIP) in place of the prior Marine Recreational Fisheries Statistics Survey (MRFSS). Although the MRIP program promises improved data for the future, assessments must also consider the past and will continue to include the earlier data from the MRFSS program. However, these historical landings were calibrated to MRIP landings based on the years where overlapping data exists. At the time this update was prepared, recreational landings based upon MRIP methods were only available for 2004-2011.

General recreational landings, general recreational discards, headboat landings, and headboat discards from 2012 were not available by the data deadline for the 2013 update. In order to continue with the assessment, these data gaps were filled by taking the geometric mean of the landings and discards data for the previous 3 years (2009-2011). In addition, changes in the recreational and commercial fishing regulations, coupled with the early closure of both sectors of the fishery in 2011 and 2012, made the use of the fishery dependent indices of abundance questionable. These regulations include a decrease in the recreational bag limit from 15 fish to 5 fish, and a new commercial trip limit of 1,000 lb gutted weight. Due to the new regulations and closures, catch per unit effort (CPUE) from either fishery may not coincide with abundance, but instead may be driven by the regulatory changes and closures. For example, a higher percentage of anglers reached the lower bag limit, at which point they were expected to stop keeping black sea bass even though more fish were available to them. Since the regulation forces anglers to stop retaining fish even if fish are available, the CPUE from this segment of the fishery will be lower than it otherwise would. When this happens, CPUE becomes unreliable as a measure of population abundance and could lead to biased estimate of abundance in the assessment results. Therefore, it was decided not to update the headboat index of abundance and the commercial handline index of abundance with the most recent years of data. The headboat at-sea observer program discard index was updated through 2011, however 2012 data were not available for this assessment.

The MARMAP/SEFIS chevron trap index of abundance used in the model is standardized, meaning that the catch per unit effort (CPUE) is adjusted through a statistical model to account for factors, other than changes in the population, which may affect the observed CPUE. Examples of such factors that are commonly addressed include yearly variation, environmental factors, depth, and sampling characteristics. While this approach improves the information obtained from the index, estimates of the parameters included in the standardization model change each time additional years of data are added, therefore changing the CPUE index for the entire time series. This index was also standardized in the SEDAR 25 (2011) benchmark assessment.

Uncertainty in the model was characterized using a technique called a "mixed Monte Carlo Bootstrap" (MCB) which enables estimates of model uncertainty to better reflect the true underlying uncertainty in model estimates. For the SEDAR 25 Update 2013, the MCB runs were modified to account for using the geometric mean in estimating landings and discards in the recreational sector. The recreational landings and discards were varied for 2012 by choosing new values for each data point from a truncated normal distribution with a mean equal to the geometric mean of the previous 3 years and a standard deviation that was obtained by examining each time series to investigate how well the geometric mean of the previous 3 years estimates the current year's value. This resulted in widening the confidence intervals around the estimate of spawning stock biomass (SSB) in the terminal year.

The SEDAR 25 Update 2013 concluded that black sea bass are not overfished and overfishing is not occurring. The stock is very close to B_{MSY} (B_{2012}/B_{MSY}=0.96) and the SSB in 2012 is just above SSB_{MSY} (SSB_{2012}/SSB_{MSY}=1.032, **Table 3.2.2.1**). SSB in 2012 was estimated

to be above $SSB_{MSY,}$ indicating that the stock is rebuilt. Spawning stock biomass decreased significantly from the beginning of the assessment period, dropping below SSB_{MSY} in 1989, until finally stabilizing and remaining at a low level from 1994-2007 (**Figure 3.2.2.1** in red). The SSB has been increasing consistently since 2008, crossing SSB_{MSY} in the terminal year of the assessment. Current fishing mortality (F) is well below F_{MSY} ($F_{Current}/F_{MSY}$=0.659, **Table 3.2.2.1**). The trend in F shows a rapid increase from the late-1970s until 1988, when it surpassed F_{MSY} by a significant amount (**Figure 3.2.2.1** in blue). F remained above F_{MSY}, with large inter-annual variability, until it dropped below F_{MSY} in 2011.

There were several concerns addressed by the assessment scientists, all related to the final estimate of SSB. The MCB runs indicate a high level of uncertainty around the terminal estimate of SSB. Approximately 32% of the MCB runs indicate that the stock is still below SSB_{MSY}. Some of the increased uncertainty in these terminal year estimates concerns the use of a geometric mean of past landings and discards in the recreational sector to estimate the 2012 landings and discards. The other concern involves the estimates of recruitment BECAUSE in the model. The increasing trend in biomass is dependent on the estimate of a strong year class in 2010. The conclusion that the stock is rebuilt is also critically dependent on the estimate of this 2010 year class. However, there is a high level of uncertainty surrounding this estimate of R in 2010. The issue is that the fish do not appear in the age samples until age 2 and the estimates of the composition of age 2 fish from this year class do not agree well with respect to the strength of this year class. In addition, R has declined in the last 2 years of the assessment and shows a cyclical pattern throughout the time series (**Figure 3.2.2.2**). The pattern shows a good year class followed by several smaller year classes. If we did have a strong year class in 2010, there may not be another one for several years or more.

Table 3.2.2.1. Benchmarks and status parameters estimated in the 2013 update to SEDAR 25 for black sea bass.
M is the average Lorenzen natural mortality, $F_{Current}$ is the geometric mean of F_{2011} and F_{2012}, F_{MSY} is the fishing mortality that produces MSY, SSB_{2012} is the estimated spawning stock biomass in 2012, SSB_{MSY} is the SSB when the stock is at MSY equilibrium, MSST is the minimum stock size threshold, B_{MSY} is the stock biomass when the stock is at MSY equilibrium, R_{MSY} is the expected number of age-0 fish when the stock is at MSY equilibrium, D_{MSY} is the expected dead discards when the stock is at MSY equilibrium, and MSY is the maximum sustainable yield. Data are from the 2013 assessment update report for black sea bass.

Quantity	Units	Estimate
M	per year	0.38
$F_{current}$	per year	0.402
F_{MSY}	per year	0.61
SSB_{2012}	1E10 eggs	265
SSB_{MSY}	1E10 eggs	256
MSST	1E10 eggs	159
B_{MSY}	1,000 lb	12,383
R_{MSY}	1,000 age-0 fish	35,843
D_{MSY}	1,000 fish	288
MSY	1,000 lb	1,780
SSB_{2012}/SSB_{MSY}	-	1.032
SSB_{2012}/MSST	-	1.66
$F_{current}/F_{MSY}$	-	0.659

3.2.3 Protected Species

There are 40 listed species protected by federal law that may occur in the exclusive economic zone (EEZ) of the South Atlantic Region and are under the purview of NMFS. Thirty-one of these species are marine mammals protected under the Marine Mammal Protection Act (MMPA). Six of these marine mammal species (sperm, sei, fin, blue, humpback, and North Atlantic right whales) are also listed as endangered under the Endangered Species Act (ESA). In addition to those six marine mammals, five species of sea turtles (green, hawksbill, Kemp's ridley, leatherback, and loggerhead); the smalltooth sawfish; five distinct population segments (DPSs) of Atlantic sturgeon; and two *Acropora* coral species (elkhorn [*Acropora 49ssue4949*] and staghorn [*A. cervicornis*]) are also protected under the ESA. Portions of designated critical habitat for North Atlantic right whales and *Acropora* corals occur within the South Atlantic Council's jurisdiction. Additionally, NMFS has proposed rules to uplist *Acropora* Corals, list 6 additional species of corals, and designate critical habitat for loggerhead sea turtles. The species most likely to interact with black sea bass pot sector of the South Atlantic Snapper-Grouper Fishery are discussed below. Because of this Amendment's emphasis on large whale interactions with black sea bass pot gear, we have provided additional information on ESA and MMPA listings histories and threats on North Atlantic right and humpback whales in **Appendix M**.

Large Whales

North Atlantic Right Whales

North Atlantic right whales generally have a stocky body, black coloration (although some have white patches on their bellies), no dorsal fin, a large head (about 1/4 of the body length), strongly bowed lower lip, and callosities (raised patches of roughened skin) on their head. Two rows of long (up to 8 ft) dark baleen plates hang from their upper jaw, with about 225 plates on each side. Their tail is broad, deeply notched, and all black with a smooth trailing edge. Right whale life expectancy is unclear, but one individual is known to have reached 65+ years of age (Hamilton et al. 1998, Kenney 2002). Adult North Atlantic right whales are generally between 13 and 16 m long and can weigh up to 71 metric tons. Females are larger than males.

Range

There are six known major habitats or aggregation areas for the North Atlantic right whales: the coastal waters of the southeastern United States; the Great South Channel; Georges Bank/Gulf of Maine; Cape Cod and Massachusetts Bays; the Bay of Fundy; and the Scotian Shelf. North Atlantic right whales follow a general annual pattern of migration between low latitude winter calving grounds and high latitude summer foraging grounds (Perry *et al*. 1999, Kenney 2002). However, movements within and between habitats are extensive. In 2000, one whale was photographed in Florida waters on January 12, then again eleven days later (January 23) in Cape Cod Bay, less than a month later off Georgia (February 16), and back in Cape Cod Bay on March 23; effectively making the round-trip migration to the Southeast and back at least

twice during the winter season (Brown and Marx 2000). Results from satellite tags clearly indicate that sightings separated by perhaps two weeks should not necessarily be assumed to indicate a stationary or resident animal. Instead, telemetry data have shown rather lengthy and somewhat distant excursions, including into deep water off the continental shelf (Mate *et al.* 1997, Baumgartner and Mate 2005).

The coastal waters of the southeastern United States are the only known calving area for right whales. Sighting records of right whales spotted in the core calving area off Georgia and Florida consist of mostly mother-calf pairs and juveniles but also some adult males and females without calves (Jackson *et al*. 2012a). As many as 243 right whales have been documented in the southeastern United States during one calving season (P. Hamilton, personal communication, April 11, 2014). Studies indicate that right whale concentrations are highest in the core calving area from November 15 through April 15 (NMFS 2008); on rare occasions, right whales have been spotted as early as September and as late as July (Taylor et al. 2010). Most calves are likely born early in the calving season. Right whale distribution off Georgia and Florida is restricted by the warm waters of the Gulf Stream, which serves as a thermal barrier (Keller et al. 2006). Water temperature, bathymetry, and surface chop are factors in the distribution of calving right whales in the southeastern United States (Keller et al. 2012, Good 2008). Additional factors that are considered significant predictors of right whale abundance in the Southeast United States include year, distance to shore, and distance to the 22˚C sea surface temperature isotherm Gowan and Ortega-Ortiz (2014). Gowan and Ortega-Ortiz (2014) also identified right whale behavior, unrelated to any specific physical or environmental feature, as factor for predicting abundance. Systematic surveys conducted off the coast of North Carolina during the winters of 2001 and 2002 sighted eight calves, suggesting the calving grounds may extend as far north as Cape Fear. Four of the calves were not sighted by surveys conducted further south. One of the females photographed was new to researchers, having effectively eluded identification over the period of its maturation (McLellan et al. 2004). Right whales generally occur off South and North Carolina from November 1 through April 30 (NMFS 2008) and have been sighted as far as about 30 nautical miles offshore (Knowlton et al. 2002, Pabst et al. 2009).

Abundance and Population Dynamics

Analysis of data on the minimum number of whales alive during 1990–2009 (based on 2011 analysis) indicate an increase in the number of catalogued whales during the period, a mean growth rate of 2.6%, but with high inter-annual variation in numbers (Waring et al., 2012). These population trends are low compared to those for populations of other large whales that are recovering, such as south Atlantic right whales and taxonomically similar western Arctic bowhead whales, which have had growth rates of 4% to 7% or more per year for decades. An analysis of the age structure of this population suggests that it contains a smaller proportion of juvenile whales than expected (Hamilton et al. 1998; Best et al. 2001), which may reflect lowered recruitment and/or high juvenile mortality.

Because of the species' low reproductive output and small population size, even low levels of human-caused mortality can pose a significant obstacle for North Atlantic right whale recovery.

Population modeling studies in the late 1990s (Caswell et al. 1999; Fujiwara and Caswell, 2001) indicated that preventing the death of two adult females per year could be sufficient to reverse the slow decline detected in right whale population trends in the 1990s.

Potential Biological Removal (PBR) Level is defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its maximum productivity (16 U.S.C. 1362(3)(9)]. The PBR is calculated using the following factors–

- the minimum population estimate of the stock;
- one-half the maximum theoretical or estimated net productivity rate of the stock at a small population size; and
- a recovery factor for endangered, depleted, threatened stocks of between 0.1 and 1.0 (MMPA Sec. 3. 16 U.S.C. 1362) (Wade and Angliss, 1997).

The recovery factor for right whales is 0.10 because this species is listed as endangered under the ESA. The minimum population size is 544 and the maximum net productivity is 0.04; thus, PBR for the North Atlantic right whale is 0.9 (Waring et al., 2013).

Threats

North Atlantic right whales were severely depleted by commercial whaling. By the early 1900s, the remaining population off North America was reduced to no more than a few hundred whales. Despite protection from commercial whaling since 1935, the remaining population has failed to fully recover. Given the small population size and low annual reproductive rate of North Atlantic right whales, human sources of mortality (particularly vessel collision and fishing gear entanglements (Clapham *et al.,* 1999; Knowlton and Kraus, 2001; Moore *et al.,* 2005; NMFS 2005) may have a greater effect to relative population growth rate than for other large whale species (Waring *et al.* 2013). NMFS has identified a number of additional threats to the species that are indirectly related to this action. Other threats to right whales may include decreased reproductive rate, reduced genetic diversity, environmental contamination, biotoxins, nutritional stress, interspecific competition, and climate change. **Appendix M** provides a discussion of these potential threats.

The primary causes of the right whale's failure to recover are deaths resulting from collisions with ships and entanglement in commercial fishing gear (Clapham et al. 1999; Knowlton and Kraus, 2001; Moore et al. 2005; NMFS 2005). Right whales may not die immediately as the result of a vessel strike or entanglement but may gradually weaken or otherwise be affected so that further injury or death is likely (Waring et al. 2013). Collisions or entanglements may result in systemic infection or debilitation from tissue damage. Additionally, any injury or entanglement that restricts a right whale from rotating its jaw while feeding, prevents it from forming a hydrostatic oral seal, compromises the integrity of its baleen, or prevents it from swimming at speeds necessary to capture prey will reduce its foraging capabilities and may lead to starvation (Cassof et al. 2011, van der Hoop et al. 2012).

An average of approximately 2 *known* vessel collision-related right whale deaths have occurred annually over the last decade (Henry et al. 2012, Waring et al. 2012) and an average of 1.2 known vessel-strike related fatalities occurred in the period 2006–2010 (Waring et al. 2012). NMFS believes the actual number of deaths is likely higher than those documented, as some deaths likely go undetected or unreported, and in many cases when deaths are observed it is not possible to determine the cause of death from recovered carcasses due, for example, to advanced decomposition.

Similarly, entanglement in fixed fishing gear is another leading cause of right whale mortality (NMFS 2005, Knowlton et al. 2012). Entanglement mortality and its effects on the right whale population are likely underestimated because fishermen may not report entanglements and it is likely that carcasses from offshore are not detected or recovered (Cole *et al.* 2006). From 2006 through 2010, 9 of 15 records of mortality or serious injury involved entanglement or fishery interactions (Waring et al. 2012). Entanglement records from 1990 through 2010 (NMFS, unpublished data) included 74 confirmed right whale entanglements, including right whales in weirs, gillnets, and trailing line and buoys. Knowlton et al. 2005 conducted a study examining 447 individual animals for evidence of scars left by fishing gear. Of the 447 whales examined, 338 of the whales (75.6%) had been entangled at least once and 608 separate entanglement interactions were documented between 1980 and 2002 (Knowlton *et al.* 2005). Further research using the North Atlantic Right Whale Catalogue has indicated that, annually, between 14% and 51% of right whales are involved in entanglements (Knowlton et al. 2005). Over time, there has been an increasing trend in entanglement rates, including an increase in the proportion of serious entanglements (Knowlton et al. 2005).

Information from an entanglement event often does not include the detail necessary to assign the entanglements to a particular fishery or location. Johnson *et al.* (2005) analyzed entanglements of 31 right whales and found that all types of fixed fishing gear and any part of the gear was involved in entanglements. When gear type was identified, pot gear and gillnet gear represented 71% and 14% of entanglements, respectively. The authors pointed out that buoy lines were involved in 51% of entanglements and suggested that entanglement risk is elevated by any line that rises in the water column. Mouth entanglements for right whales were the most common point of entanglement (77.4%) and were particularly deadly; 55.6% of right whales seen with mouth entanglements died (Johnson *et al.* 2005). Mouth entanglements likely occur when a whale's mouth is open giving rise to speculation that entanglements occur when whales are feeding (Johnson *et al.* 2005). Occasionally, right whales with open mouths are observed in the southeastern U.S. calving area (Jackson *et al.* 2012b, Jackson *et al.* 2011).

Calves and juveniles become entangled more frequently than adults and are more likely to suffer deep wounds (> 8cm) from entanglement. Knowlton et al. (2011) studied ropes that were removed from entangled right whales (dead and alive) and suggested that a whale's ability to break free of entangling gear is related to its age. Breaking strength of rope also influences a whale's ability to break free of entangling gear. Adults appear to be able to break free of ropes with a breaking strength of less than 3,300 lbs, but calves and juveniles cannot and are more prone to drowning (Knowlton et al. 2011, Cassof et al. 2011).

Gear trailing behind a right whale creates substantial drag and may inhibit foraging (van der Hoop *et al.* 2013). Entanglements may also reduce a whale's ability to maneuver, making it more susceptible to ship strikes (NMFS 2006).

Humpback Whales

Humpback whales are known for their long pectoral fins, which can be up to 15 feet long. These long fins give them increased maneuverability; they can be used to slow down or even go backwards. Similar to all baleen whales, adult females are larger than adult males, reaching lengths of up to 60 feet. Their body coloration is primarily dark grey, but individuals have a variable amount of white on their pectoral fins and belly. This variation is so distinctive that the pigmentation pattern on the undersides of their "flukes" is used to identify individual whales, similar to a human fingerprint.

Range

Like right whales, humpback whales follow a general annual pattern of migration between low latitude winter calving grounds (in the West Indies) and high latitude summer foraging grounds. Humpback whales feed during spring, summer, and fall in the Gulf of Maine, the Gulf of St. Lawrence, Newfoundland/ Labrador, and western Greenland. In the Gulf of Maine, sightings are most frequent from mid-March through November between 41°N and 43°N, from the Great South Channel north along the outside of Cape Cod to Stellwagen Bank and Jeffreys Ledge, and peak in May and August (CETAP, 1982). Small numbers of individuals may be present in New England waters year-round, including the waters of Stellwagen Bank (Clapham et al, 1993). In winter, humpback whales calve primarily in the West Indies, specifically in the Antilles, primarily on Silver and Navidad Banks, north of the Dominican Republic (Clapham et al. 1993; Katona and Beard, 1990; Palsboll et al. 1997; Stevick et al. 1998). The primary winter range also includes the Virgin Islands and Puerto Rico.

Humpback whales are assumed to use the Mid-Atlantic as a migratory pathway to and from the calving/mating grounds. The Mid-Atlantic may also be an important winter feeding area for juveniles. Since 1989, observations of juvenile humpbacks in the Mid-Atlantic have been increasing during the winter months, peaking from January through March (Swingle et al. 1993). Biologists theorize that non-reproductive animals may be establishing a winter feeding range in the Mid-Atlantic since they are not participating in reproductive behavior in the Caribbean (Barco et al. 2002). Swingle et al. (1993) identified a shift in distribution of juvenile humpback whales in the nearshore waters of Virginia, primarily in winter months. Identified whales using the Mid-Atlantic area were found to be residents of the Gulf of Maine and Atlantic Canada (Gulf of St. Lawrence and Newfoundland) feeding groups, suggesting a mixing of different feeding populations in the Mid-Atlantic region (Barco et al. 2002). Strandings of humpback whales have increased between New Jersey and Florida since 1985, consistent with the increase in Mid-Atlantic whale sightings. Strandings were most frequent from September through April in North

Carolina and Virginia waters, and involved primarily juvenile humpback whales of no more than 35 feet long (Wiley et al. 1995).

Life History and Reproductive Success

It is generally believed that copulation and calving take place on the winter range in the Greater and Lesser Antilles. The gestation period in humpback whales is 12 months and females give birth every 2 to 3 years, usually between December and May (Clapham and Mayo, 1987).

Abundance and Population Dynamics

Modeling using data obtained from photographic mark-recapture studies estimates the growth rate of the Gulf of Maine feeding population at 6.5% (Barlow and Clapham, 1997). More recent studies have found lower growth rates of 0.0 percent to 4.0 percent, although these results may be a product of shifts in humpback distribution (Clapham et al. 2003). Current data suggest that the Gulf of Maine humpback whale stock is steadily increasing in size (Waring et al. 2012). With respect to the North Atlantic population overall, there are indications of increasing abundance. One study estimated a growth rate of 3.1 percent for the period from 1979 to 1993 (Stevick et al. 2001).

Potential Biological Removal for the Gulf of Maine humpback whale stock is 2.7 whales per year. As noted, PBR is the product of minimum population size, one-half the maximum productivity rate, and a "recovery" factor (MMPA Sec. 3. 16 U.S.C. 1362) (Wade and Angliss, 1997). The minimum population size for the Gulf of Maine stock is 823 whales. The maximum productivity rate is 0.065. The "recovery" factor is assumed to be 0.10 because the humpback whale is listed as endangered under the ESA.

Threats

As with right whales, the major known sources of human-caused mortality and injury of humpback whales are commercial fishing gear entanglements and ship strikes. Sixty percent of closely investigated Mid-Atlantic humpback whale mortalities showed signs of entanglement or vessel collision (Wiley et al. 1995). From 2006 through 2010, there were at least 10 reports of mortalities as a result of collision with a vessel and 29 serious injuries and mortalities attributed to entanglement. Many carcasses also washed ashore or were spotted floating at sea for which the cause of death could not be determined. Robbins (2009) found that 64.9% of the North Atlantic population had entanglement scarring, which corresponds to approximately 66 entanglement cases per year. These estimates are based on sightings of free-swimming animals that initially survive the encounter. Some whales may drown immediately, others may be too decomposed for analysis, and some may never be examined. For these reasons, it is likely the actual number of interactions with fishing gear is higher than recorded (Waring et al. 2006).

Johnson et al. (2005) noted that any part of the gear (buoy line, groundline, floatline, and surface system line) creates a risk for entanglement. Johnson et al. (2005) also reported that of

the 30 humpback whale entanglements examined in the study, 16 (53%) involved entanglements in the tail region and 13 (43%) involved entanglements in the mouth (note that in both cases, some entanglements included other points of gear attachment on the body). Although the sample size was small for cases in which the point of gear attachment and the associated gear part could be examined, 2 out of 2 floating groundline entanglements and 4 out of 7 buoy line entanglements involved the mouth.[1] In addition, 5 out of 7 buoy line entanglements and 3 out of 4 gillnet floatline entanglements involved the tail (Johnson et al. 2005).[2]

Based on studies of humpback whale caudal peduncle scars, Robbins and Mattila (2000) reported that calves (approximately 0-1 year) had a lower entanglement risk than yearlings (1 year old), juveniles, and mature whales; the latter 3 maturational classes exhibited comparable levels of high probability scarring. Based on these data as well as evidence that animals acquire new injuries when mature, the authors concluded that actively feeding whales may be at greater risk of entanglement. In any case, juveniles seemed to be at the most risk, possibly due to their relative inexperience.

Humpback whales employ a variety of foraging techniques, which may create entanglement risk (Hain et al. 1982 and Weinrich et al. 1992). They feed on a number of species of small schooling fishes and krill (Wynne and Schwartz, 1999), by targeting fish schools and filtering large amounts of water for their associated prey. One such technique is lunge feeding, in which the whale swims toward a patch of krill or small fish, then lunges into the patch with its mouth agape. The flippers may aid in concentrating the prey or in maneuvering. Another feeding method, called "flick-feeding," involves flexing the tail forward when the whale is just below the surface, which propels water over the whale's head, temporarily disorienting its prey. The whale then swims with its mouth open, through the wave it created. A third foraging strategy is bubble feeding, in which whales swim upwards, while blowing nets or clouds of bubbles, in a spiral under a concentration of prey. This creates a barrier through which the disoriented fish cannot escape. The whales then swim up through the bubble formation, engulfing their prey. These techniques demonstrate that humpback whales commonly use their mouths, flippers, and tails to aid in feeding. Thus, while foraging, all body parts are at risk of entanglement.

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.) 2003).

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

[1] Note that one humpback whale was entangled in both buoy line and groundline and was placed in both categories.
[2] Note that the entanglements in buoy line exceed the total of 7 because some animals were entangled in multiple locations on their body (e.g., both the mouth and the tail).

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

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

Kemp's ridley hatchlings are also pelagic during the early stages of life and feed in surface waters (Carr 1987, Ogren 1989). Once the juveniles reach approximately 20 cm carapace length they move to relatively shallow (less than 50m) benthic foraging habitat over unconsolidated substrates (Márquez-M. 1994). They have also been observed transiting long distances between foraging habitats (Ogren 1989). Kemp's ridleys feeding in these nearshore areas primarily prey on crabs, though they are also known to ingest mollusks, fish, marine vegetation, and shrimp (Shaver 1991). The fish and shrimp Kemp's ridleys ingest are not thought to be a primary prey item but instead may be scavenged opportunistically from bycatch discards or from discarded bait (Shaver 1991). Given their predilection for shallower water, Kemp's ridleys most routinely make dives of 50 m or less (Soma 1985, Byles 1988). Their maximum diving range is unknown. Depending on the life stage 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 (56ssue56, 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 1000 m (Eckert et al. 1989) but more frequently dive to depths of 50 m to 84 m (Eckert et al. 1986). Dive times range from a maximum of 37 minutes to more routines dives of 4 to 14.5 minutes (Standora et al. 1984, Eckert et al. 1986, Eckert et al. 1989, Keinath and Musick 1993). Leatherbacks may spend 74% to 91% of their time submerged (Standora et al. 1984).

Loggerhead hatchlings forage in the open ocean and are often associated with *Sargassum* rafts (Hughes 1974, Carr 1987, Walker 1994, Bolten and Balazs 1995). The pelagic stage of these sea turtles 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 cm straight-line carapace length they begin to live in coastal inshore and nearshore waters of the continental shelf throughout the U.S. Atlantic (Witzell 2002). Here they forage over hard- and soft-bottom habitats (Carr 1986). Benthic foraging loggerheads eat a variety of invertebrates with crabs and mollusks being an important prey source (Burke et al. 1993). Estimates of the maximum diving depths of loggerheads range from 211 m to 233 m (692-764 ft.) (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, Lanyon et al. 1989) and they may spend anywhere from 80 to 94% of their time submerged (Limpus and Nichols 1994, Lanyon et al. 1989).

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).

North Atlantic Right Whale Critical Habitat

In 1994, NMFS published a final rule designating critical habitat for right whales (59 FR 28793, June 3, 1994). The designated critical habitat included portions of Cape Cod Bay and Stellwagen Bank, the Great South Channel (each off the coast of Massachusetts), and the waters adjacent to the coast of Georgia and the east coast of Florida. These areas were determined to be essential to the conservation of right whales because of their importance as foraging, calving, and nursing habitats. For example, Cape Cod Bay and the Great South Channel represent two of the four known principal feeding grounds for adult right whales in the Western North Atlantic and the only two within U.S. waters. In addition, the waters off Georgia and Northern Florida have been identified as the only known calving ground for right whales. However, the designations were based primarily on right whale sightings data as opposed to an analysis of the physical and biological habitat features essential to the conservation of the species.

In July 2002, NMFS received a petition requesting revision of the current critical habitat designation for right whales, by combining and expanding the current Cape Cod Bay and Great South Channel critical habitats in the Northeast and by expanding the current critical habitat in the Southeast. In August 2003, NMFS determined that the requested revision, as specified by the petitioner, was not warranted at that time. On October 1, 2009, NMFS received another petition, this time from the Center for Biological Diversity (CBD), Defenders of Wildlife, Humane Society of the United States, Ocean Conservancy, and the Whale and Dolphin Conservation Society (the Petitioners) to revise the designated North Atlantic right whale critical habitat. The petition wanted to expand the existing North Atlantic right whale critical habitat by including more areas designated as critical feeding and calving habitat, and including a migratory corridor. On October 6, 2010, NMFS announced the 90-day finding: that the petition, in conjunction with the information readily available in the files, presents substantial scientific information indicating that the requested revision may be warranted. The October 6, 2010, Federal Register notice also included a 12-month determination on how to proceed with the petition: that NMFS would continue the ongoing rulemaking process which would result in the publication of a proposed rule in the Federal Register regarding North Atlantic right whale critical habitat.

3.3 Human Environment

3.3.1 Economic Description of the Commercial Sector

Snapper Grouper Fishery

The South Atlantic Fishery Management Council manages 6 key species groups, in addition to sargassum and coral/coral reefs. From 2009 through 2013, the snapper grouper complex accounted for the highest percentage of commercial landings (gw) at 39% followed by coastal migratory pelagics at 37% and spiny lobster at 14%. The rest of the species groups represented 10% of commercial landings, with golden crap accounting for 4% of total landings. In terms of dockside revenues (2013 $), the snapper grouper complex represented the highest share at 38%, followed by spiny lobster at 33%, with coastal migratory pelagics ranking third at 19%. Golden crab accounted for 3% of total dockside revenues.

Any fishing vessel that harvests and sells any of the snapper grouper species from the South Atlantic EEZ must have a valid South Atlantic commercial snapper grouper permit, which is a limited access permit. There are currently 547 valid South Atlantic Snapper Grouper Unlimited Permits and 117 valid 225 lb Trip Limited Permits (**Table 3.3.1.1**). After a permit expires, it can be renewed and transferred up to one year after it expires. The numbers of valid and transferrable/renewable permits have declined since 2009 (**Table 3.3.1.2**). For harvesting black sea bass using traps, a black sea bass pot endorsement is required. This is a limited access form of a system, so no new black sea bass pot endorsement will be issued. Like a permit, an endorsement may be transferred, subject to certain requirements. There are 32 endorsements established through Amendment 18A.

Table 3.3.1.1. Valid and transferrable/renewable South Atlantic commercial snapper grouper permits as of January 30, 2014.

South Atlantic S-G Permits	Unlimited lb	225 lb
Valid	547	117
Transferrable/Renewable	22	8
Total	569	125

Source**:** NMFS SERO PIMS, 2014**.**

Table 3.3.1.2. Number of South Atlantic commercial snapper grouper permits.

	Unlimited	Limited 225 lb
2009	640	144
2010	624	139
2011	569	126
2012	558	123
2013	593	130
Average	597	132

Source: NMFS SERO PIMS, 2014.

The following focuses on commercial landings and revenues for black sea bass. The major sources of data summarized in this description are the SEFSC Commercial ACL Dataset, as summarized by SERO-LAPP, and Federal Logbook System (FLS), supplemented by average prices calculated from the Accumulated Landings System (ALS) and price indices taken from the Bureau of Labor Statistics. Landings from the FLS do not include all landings shown from the ACL dataset due to landings by fishermen who do not have the federal snapper grouper permit and are not required to complete the logbook; non-reporting in the logbook program is also an issue. Additional information on the commercial snapper grouper sector is contained in previous amendments and is incorporated herein by reference [see Amendment 13C (SAFMC 2006), Amendment 15A (SAFMC 2008a), Amendment 15B (SAFMC 2008b), Amendment 16 (SAFMC 2009a), Regulatory Amendment 9 (SAFMC 2011a), Comprehensive ACL Amendment for the South Atlantic Region (SAFMC 2011c), Amendment 18A (SAFMC 2012, and Regulatory Amendment 19 (SAFMC 2013)] .

Total Annual Landings and Revenues for Black Sea Bass

The commercial black sea bass fishing fleet in the South Atlantic is composed of vessels using primarily black sea bass pots and hook and line gear. Other gear types have also been used for harvesting black sea bass. The commercial fishing season for black sea bass used to be from January 1 through December 31, but it was changed to June 1 through May 31 under Amendment 13C (SAFMC 2006). Regulatory Amendment 14 will change this fishing year back to January 1 through December 31, starting in 2015. It is noted that a one-month delay for the 2012/2013 season was enacted to allow for some changes in regulations to take effect before the start of the fishing season. For presentation purposes, a fishing year is defined as June 1 through May 31. For each fishing year from 2000/01 through 2012/13 and on average, traps were the dominant gear type for harvesting black sea bass by weight and by revenue (**Table 3.3.1.3**). Notable, nonetheless, are the relatively large increases in hook-and-line landings and revenues in the 2012/2013 season. It will be shown later that, based on logbook reports, landings and revenues for gear other than traps also substantially increased in the 2013/14 fishing season.

Table 3.3.1.3. Black sea bass commercial landings (lb gw) and dockside revenues (2013 $) by gear type, fishing year 2000/01--2012/13.

	Traps	Hook and Line	Others	Total
Landings (lb gw)				
2000/01	371,939	81,697	16,775	470,412
2001/02	409,725	71,003	10,476	491,204
2002/03	275,549	60,423	5,120	341,092
2003/04	569,610	95,197	11,420	676,227
2004/05	448,245	92,023	1,282	541,550
2005/06	290,725	51,481	431	342,636
2006/07	397,783	59,184	1,472	458,439
2007/08	243,257	54,528	1,132	298,917
2008/09	268,343	44,697	81,668	394,708
2009/10	236,222	52,409	48,103	336,735
2010/11	289,630	51,911	94,819	436,360
2011/12	235,150	40,106	110,383	385,639

2012/13	178,733	83,493	121,066	383,292
Average	324,224	64,473	38,781	427,478
Revenues (2013 $)				
2000/01	$865,213	$223,687	$33,236	$1,122,137
2001/02	$891,711	$178,664	$24,952	$1,095,327
2002/03	$588,560	$143,362	$12,970	$744,893
2003/04	$1,238,589	$226,862	$25,533	$1,490,984
2004/05	$969,979	$222,968	$2,629	$1,195,576
2005/06	$733,657	$141,417	$964	$876,038
2006/07	$1,077,861	$177,690	$3,617	$1,259,167
2007/08	$651,026	$157,465	$2,513	$811,005
2008/09	$682,722	$129,610	$205,166	$1,017,498
2009/10	$570,237	$141,543	$149,052	$860,831
2010/11	$742,554	$136,043	$290,094	$1,168,691
2011/12	$470,491	$102,502	$291,492	$864,484
2012/13	$489,671	$254,106	$360,663	$1,104,440
Average	$767,098	$171,994	$107,914	$1,047,005

Source: SEFSC Commercial ACL Dataset, ACL_Tables_07102014.

Among the various states, North Carolina accounted for the largest amount of landings for black sea bass by weight and revenue (**Table 3.3.1.4**). South Carolina generally came in second, and Florida/Georgia third. In 2011/12, however, Florida/Georgia landings by weight and revenues increased quite substantially, topping South Carolina. North Carolina landings include black sea bass landings that were likely caught in the South Atlantic but reported by dealers in the Northeast. Such landings annually averaged about 49,000 lb gw with a dockside value of $137,000 for fishing years 2010/11 through 2012/13. Prior to those fishing years, there were virtually no such reported landings.

Table 3.3.1.4. Black sea bass commercial landings (lb gw) and dockside revenues (2013 $) by state/area, fishing year 2000/01--2012/13.

	Florida/Georgia	South Carolina	North Carolina	Total
Landings (lb gw)				
2000/01	5,235	88,525	376,652	470,412
2001/02	8,244	50,931	432,029	491,204
2002/03	6,294	41,303	293,496	341,092
2003/04	10,032	197,111	469,084	676,227
2004/05	13,742	119,018	408,791	541,550
2005/06	7,217	64,697	270,723	342,636
2006/07	9,950	100,765	347,724	458,439
2007/08	7,567	105,046	186,304	298,917
2008/09	8,705	113,337	272,666	394,708
2009/10	40,877	60,209	235,648	336,735
2010/11	78,076	82,961	275,323	436,360
2011/12	114,213	84,528	186,898	385,639
2012/13	60,819	99,620	222,853	383,292
Average	28,536	92,927	306,015	427,478
Revenues (2013 $)				
2000/01	$9,022	$203,932	$909,183	$1,122,137
2001/02	$15,682	$121,481	$958,164	$1,095,327

2002/03	$12,890	$105,858	$626,145	$744,893
2003/04	$21,831	$432,911	$1,036,242	$1,490,984
2004/05	$29,441	$268,753	$897,383	$1,195,576
2005/06	$17,216	$176,103	$682,719	$876,038
2006/07	$26,365	$284,151	$948,652	$1,259,167
2007/08	$18,497	$269,951	$522,557	$811,005
2008/09	$21,861	$284,995	$710,643	$1,017,498
2009/10	$92,441	$184,486	$583,903	$860,831
2010/11	$155,671	$225,837	$787,183	$1,168,691
2011/12	$170,164	$188,487	$505,833	$864,484
2012/13	$132,786	$307,323	$664,331	$1,104,440
Average	$55,682	$234,944	$756,380	$1,047,005

Source: SEFSC Commercial ACL Dataset, ACL_Tables_07102014.

Most commercial fisheries are subject to seasonality, perhaps due to weather, regulations, markets for the fish, and the like. The commercial black sea bass segment of the snapper grouper fishery is no exception. For purposes of showing how seasonality possibly changed over time, three sub-periods are considered, 2000/01-2005/06, 2006/07-2009/10, and 2010/11-2012/13. The second sub-period starts right about the time the fishing season was changed from a calendar year to June 1-May 31, and the third sub-period starts at about the time closures to commercial harvest of black sea bass began to be implemented. Overall, a relatively strong seasonality characterizes the commercial landings (and revenues) for black sea bass (**Figure 3.3.1.1**). The first two sub-periods show about similar seasonality pattern: landings started at relatively low levels from June through October, rose in November with a peak in December and dropped thereafter. Apparently, the change in the fishing season did not alter the seasonality pattern of landings. The third sub-period is markedly different from the other two. Peak landings occurred at the start of the fishing season and dropped rather steeply through November, with a spike in December. The landings spike in December is similar to that of the other two sub-periods. The change in seasonality pattern in the third period may be mainly attributed to fishing closures that reduced landings in the latter part of the season and that also motivated fishermen to fish harder at the start of the next fishing season. The three sub-periods also show different levels of average landings per month. From October through May, average monthly landings were highest in the first sub-period and lowest in the third sub-period, with those in the second sub-period falling between those of the first and third sub-periods. The reverse holds for the months of June through September, with the third sub-period showing the highest monthly landings and the first sub-period, the lowest monthly landings.

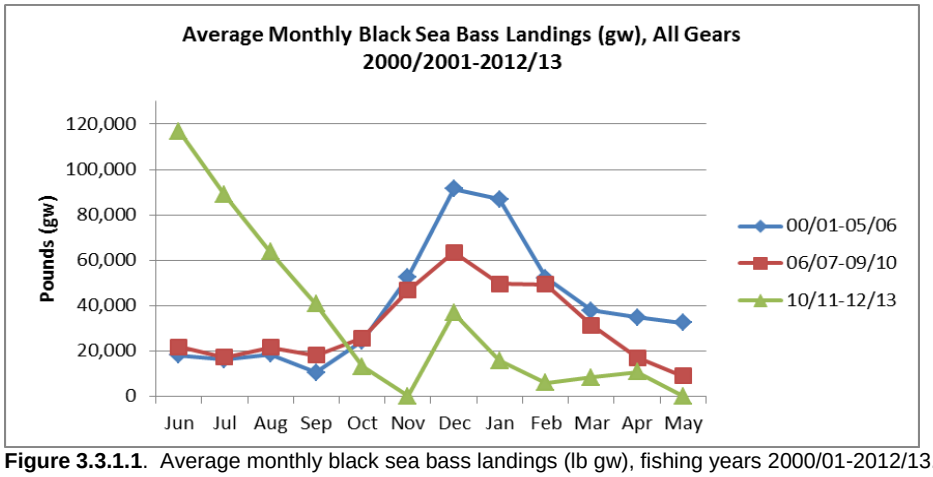

Figure 3.3.1.1. Average monthly black sea bass landings (lb gw), fishing years 2000/01-2012/13. Source: SEFSC Commercial ACL Dataset, ACL_Tables_07102014.

The seasonality pattern for, and the level of, black sea bass landings by traps only appear similar to that for all gear types in each of the three sub-periods (**Figure 3.3.1.2**). This is probably as expected because traps have been the dominant gear type for black sea bass commercial landings.

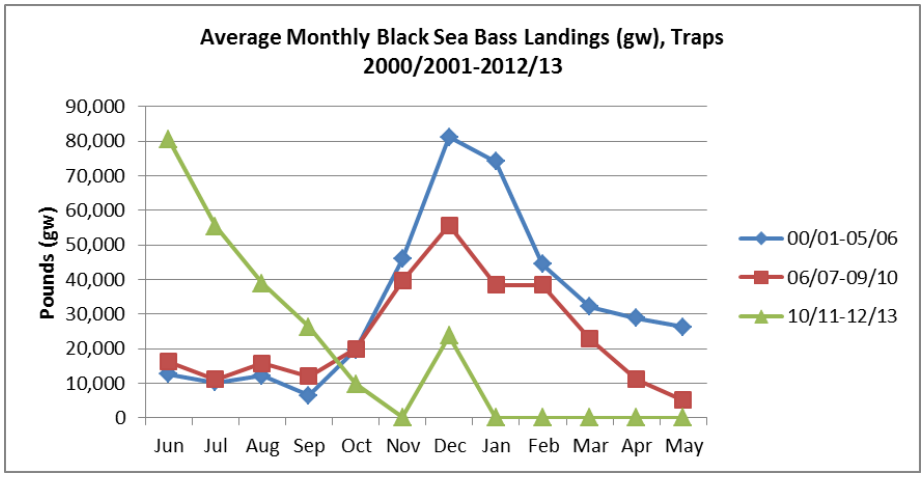

Figure 3.3.1.2. Average monthly black sea bass landings (lb gw), fishing years 2000/01-2012/13. Source: SEFSC Commercial ACL Dataset, ACL_Tables_07102014.

The seasonality pattern for landings by other gear types is quite different from that for landings by all gear types (**Figure 3.3.1.3).** Peak landings in the first two sub-periods occurred in January,

whereas peak landings for all gear types occurred in December. The landings spike in the third sub-period also occurred in January and not in December. Also observable for the third sub-period is the smaller landings spike that occurred in April. However, peak landings in the third sub-period occurred in June, similar to that for landings by all gear types. Considering that trap landings were generally zero from January through May, the seasonality pattern observed in the landings by all gear types during these months could be mainly conditioned by the seasonal pattern of landings by other gear types. In terms of level of landings, the third sub-period recorded higher landings in the second half of the fishing year (except February and May) than the other two sub-periods.

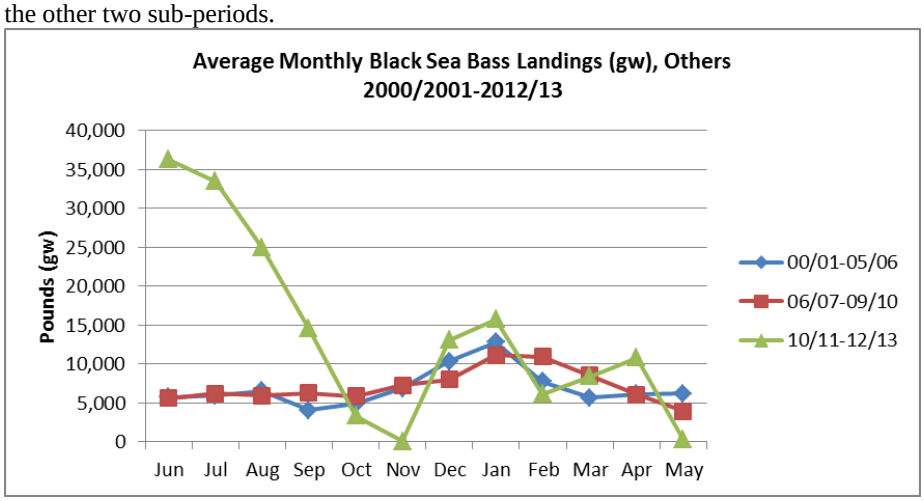

Figure 3.3.1.3. Average monthly black sea bass landings (lb gw), fishing years 2000/01-2012/13. Source: SEFSC Commercial ACL Dataset, ACL_Tables_07102014.

Landings in the Florida/Georgia area show no apparent seasonal pattern for the first two sub-periods, although the second sub-period shows a slight spike in September (**Figure 3.3.1.3**). Seasonality of landings in the third sub-period generally follows that of landings for all gear types, with peak landings in June and a landings spike in December.

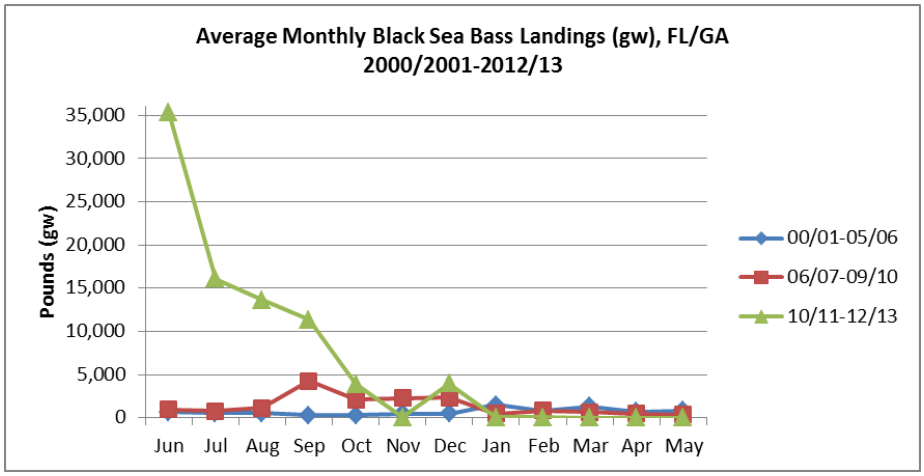

Figure 3.3.1.4. Average monthly black sea bass landings (lb gw), fishing years 2000/01-2012/13. Source: SEFSC Commercial ACL Dataset, ACL_Tables_07102014.

On average, peak landings in South Carolina differed across the three sub-periods. The first sub-period shows peak landings in January, the second sub-period in February, and the third sub-period in June with a spike in December (**Figure 3.3.1.5**). Other than the occurrence of peak landings, the seasonal pattern of landings in South Carolina appears to follow that for landings by traps only.

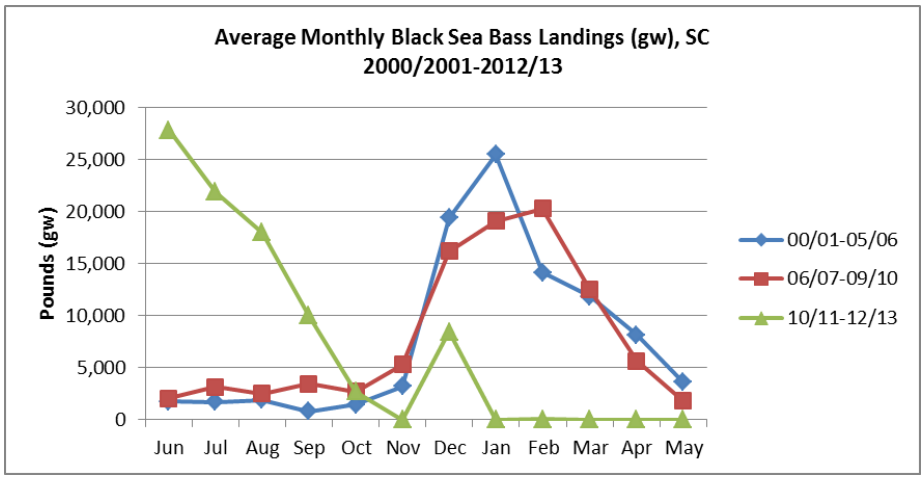

Figure 3.3.1.5. Average monthly black sea bass landings (lb gw), fishing years 2000/01-2012/13. Source: SEFSC Commercial ACL Dataset, ACL_Tables_07102014.

The seasonality of landings in North Carolina is slightly similar to that of landings by all gear types. Peak landings occurred in December for the first two sub-periods and in June for the third sub-period with a spike in December (**Figure 3.3.1.6**). This is almost as expected since North Carolina has been the dominant state for black sea bass landings. However, unlike the case with landings by all gear types, peak landings for the third sub-period in North Carolina were lower than peak landings for the first sub-period.

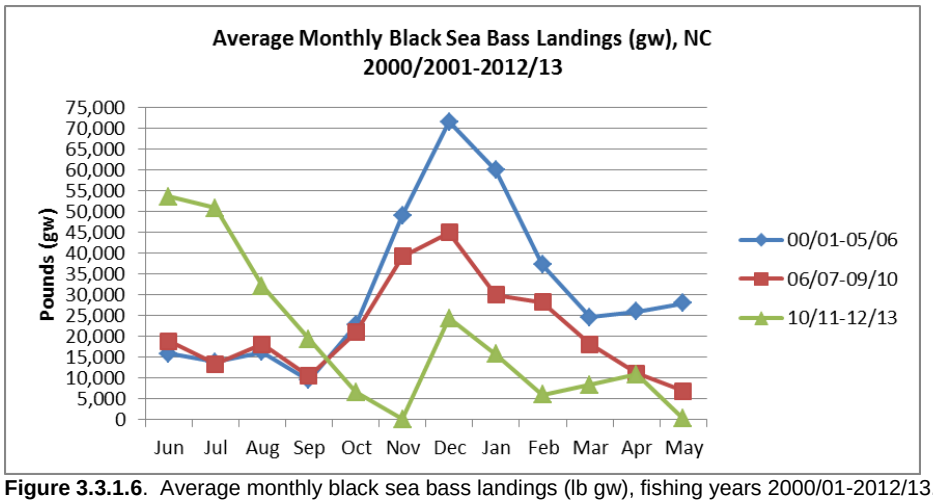

Figure 3.3.1.6. Average monthly black sea bass landings (lb gw), fishing years 2000/01-2012/13. Source: SEFSC Commercial ACL Dataset, ACL_Tables_07102014.

There are many techniques for analyzing prices of a commodity including fish. The current approach is simple and straightforward with the main intent of providing a general description of monthly black sea bass prices. For the current purpose, prices are derived by dividing total revenues by total pounds, averaged for each month over the years within a sub-period, and expressed in 2013 dollars.

In general, prices varied across months for black sea bass landings by all gear types (**Figure 3.3.1.7**). Price variation appears to be within a narrow band for the first two sub-periods and over a wider range for the third sub-period. The lowest prices occurred in November for the first sub-period, October for the second sub-period, and June for the third sub-period. The lowest price coincided with peak landings for the third period, but not quite for the first two periods. As noted earlier, peak landings for each of the first two sub-periods occurred in December. The highest prices occurred in May for the three sub-periods, although the September price was about the same or slightly higher than the May price for the first sub-period. While the first two sub-periods show about similar seasonal pattern in prices, the third period is very different. For the third period, price rose quite sharply in July and August, remained steady in the next two months, spiked in November, fell in the next month, and rose sharply thereafter before reaching its peak in May. In general, prices increased over the years, with the first sub-period showing the

lowest monthly prices and the last sub-period, the highest monthly prices. An exception to this is that prices for the third sub-period were not the highest in June and July.

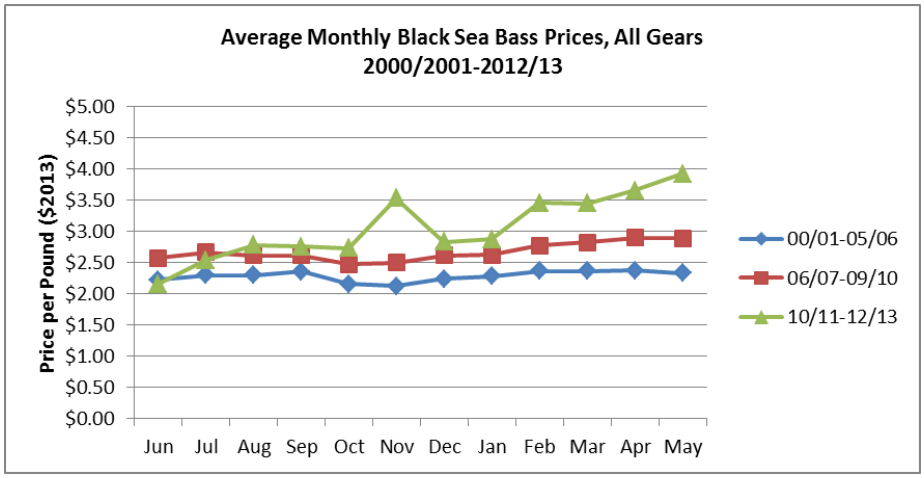

Figure 3.3.1.7. Average monthly black sea bass prices (2013 $), fishing years 2000/01-2012/13.
Source: SEFSC Commercial ACL Dataset, ACL_Tables_07102014.

The price pattern for trap landings closely mimics that for landings by all gear types, except that there are not reported prices for trap landings from January through due to zero trap landings for these months (**Figure 3.3.1.8**). As with the seasonality of landings, this finding on price patterns for all gear types and traps is almost as expected because traps are the predominant gear in harvesting black sea bass. The absence of trap landings from January through May could also be one reason for the overall prices to be generally higher during these months. This, of course, assumes that, at least, black sea bass demand during these months remained steady as in the previous sub-periods.

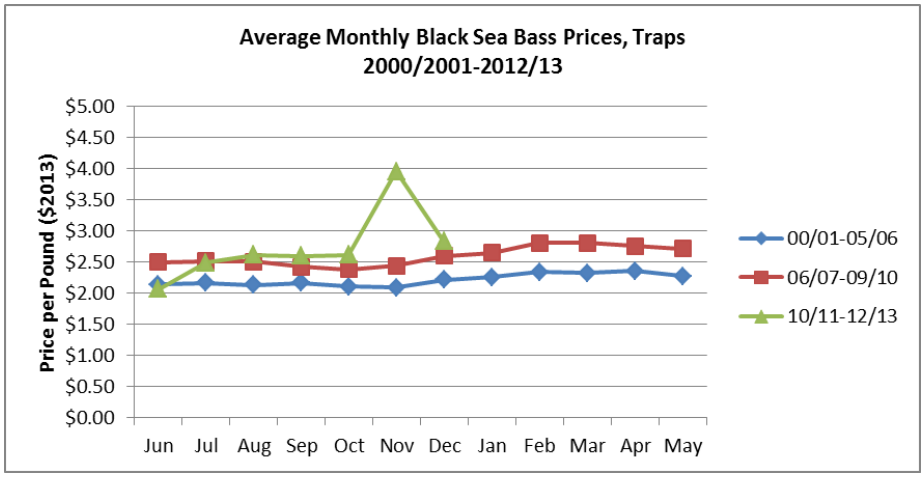

Figure 3.3.1.8. Average monthly black sea bass prices (2013 $), fishing years 2000/01-2012/13.
Source: SEFSC Commercial ACL Dataset, ACL_Tables_07102014.

Although in general, the pattern of monthly prices for landings by the other gear types is about similar to that of landings by all gear types, there are some differences worth noting. The lowest prices occurred in October (vs. November) for the first sub-period and January (vs. October) for the second sub-period (**Figure 3.3.1.9**). Moreover, for the third sub-period, price spiked in November for landings by all gear types but dipped for landings by the other gear types. This indicates that the price spike for landings by all gear types was primarily due to the price spike for trap landings. In addition, for the third sub-period, the pattern of prices for landings by all gear types during January through May exactly matches that for landings by the other gear types.

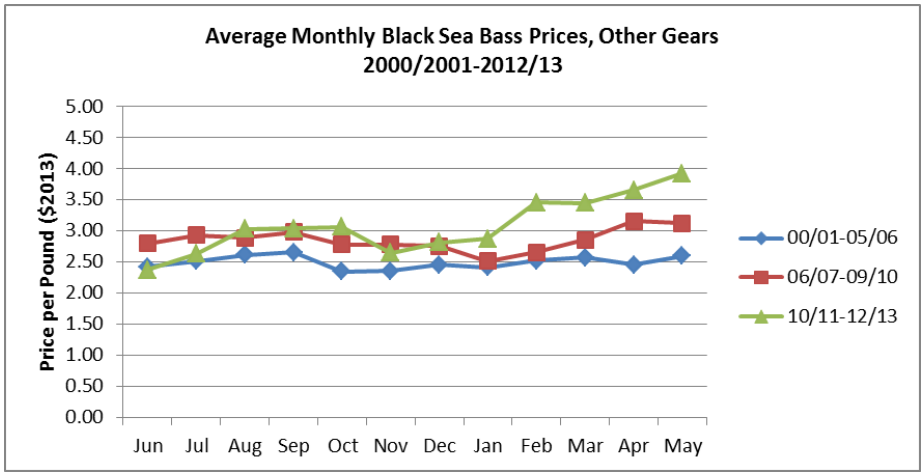

Figure 3.3.1.9. Average monthly black sea bass prices (2013 $), fishing years 2000/01-2012/13.
Source: SEFSC Commercial ACL Dataset, ACL_Tables_07102014.

Seasonality of prices can also be examined on a state-by-state basis. Peak landings in Florida/Georgia occurred in March for the first two periods, although June also registered a high price for the second period (**Figure 3.3.1.10**). For the third period, prices peaked in November; high prices in April and May are less accurate because of very low landings for these months. For the first two sub-periods, prices appear to be relatively stable, fluctuating within a narrow range. The last sub-period shows wider fluctuations in prices, particularly in the latter part of the fishing year. Moreover, prices for the third sub-period were generally not higher than those in the earlier sub-periods.

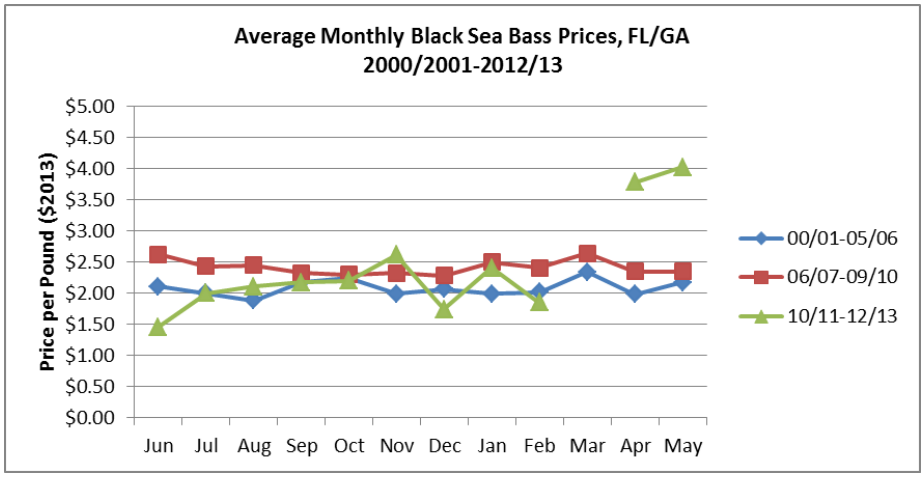

Figure 3.3.1.10. Average monthly black sea bass prices (2013 $), fishing years 2000/01-2012/13. Source: SEFSC Commercial ACL Dataset, ACL_Tables_07102014.

In South Carolina, prices generally rose in the first four months, fell in subsequent months until reaching their lowest levels in January, and steadily rose thereafter (**Figure 3.3.1.11**). However, lowest price in the third sub-period occurred in June. There are no reported prices starting in January for the third sub-period; price for February is unreliable due to very low landings. South Carolina prices for the third sub-period were higher than those for the earlier sub-periods only in October through December.

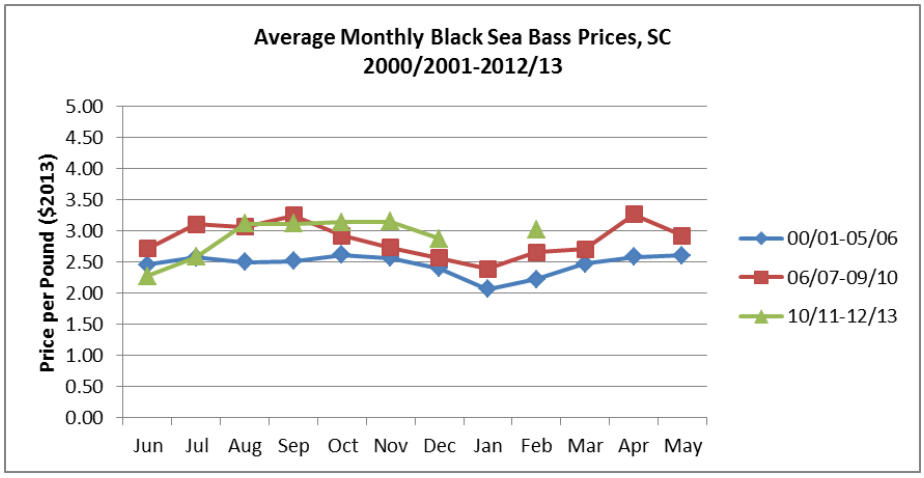

Figure 3.3.1.11. Average monthly black sea bass prices (2013 $), fishing year 2000/01-2012/13.
Source: SEFSC Commercial ACL Dataset, ACL_Tables_07102014.

The seasonality of prices in North Carolina closely mirrors that for landings by all gear types (**Figure 3.3.1.12**). This close similarity in the seasonality pattern of prices is almost as expected because of the dominance of North Carolina in black sea bass landings and revenues. In general, prices increased over time, with the third sub-period registering the highest price levels among the three sub-periods.

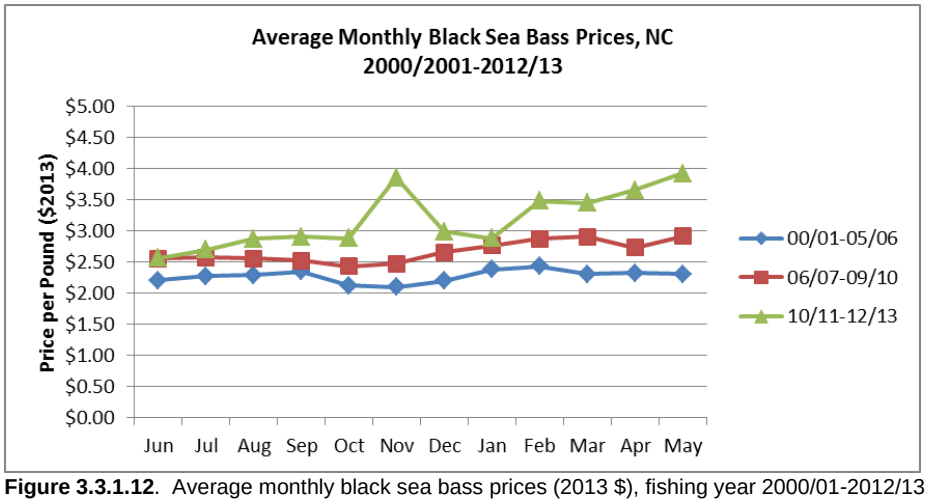

Figure 3.3.1.12. Average monthly black sea bass prices (2013 $), fishing year 2000/01-2012/13.
Source: SEFSC Commercial ACL Dataset, ACL_Tables_07102014.

Vessel Level Landings and Dockside Revenues for Black Sea Bass

Landings information in the tables below is solely based on logbook data and so would not exactly match with landings shown in the earlier tables. From 2000/01 through 2013/14, an annual average of 234 vessels took 2,013 commercial trips that combined landed an average of 422,200 lb gw of black sea bass annually with a dockside value (2013 dollars) of $1,094,059 (**Table 3.3.1.5**). Average annual dockside revenue from black sea bass landings represented approximately 22% of total dockside revenue from trips that landed black sea bass from 2000/01 through 2013/14. Fishing year 2008/09 had the most number of vessels landing black sea bass, but the highest black sea bass landings occurred in 2003/04 and highest dockside revenues from black sea bass occurred in 2013/14. Including revenues from black sea bass and other species jointly caught and landed with black sea bass, the highest total revenues occurred in 2001/02, with the second highest occurring in 2013/14. The recent increase in the black sea bass ACL immediately translated into a relatively large landings increase in 2013/14. The number of vessel trips more than doubled in 2013/14 from that in 2012/13.

Table 3.3.1.5. Vessels and trips with black sea bass landings by weight (lb gw) and dockside revenue (2013 $), fishing years 2000/01–2013/14. **ALL GEARS.**

Year	Number vessels that landed black sea bass	Number trips that landed black sea bass	Black sea bass landings (lb gw)	Dockside revenue from black sea bass (2013 $)	'Other species' landed and jointly caught with black sea bass (lb gw)	Dockside revenue from 'other species' from trips with black sea bass landings (2013 $)	Total dockside revenue (2013 $) from trips with black sea bass landings
2000/01	248	2,589	506,450	$1,278,557	1,501,126	$4,485,103	$5,763,660
2001/02	250	3,019	495,863	$1,165,505	1,928,448	$5,546,695	$6,712,199
2002/03	235	2,244	361,497	$853,225	1,484,873	$4,193,030	$5,046,256
2003/04	239	2,365	656,446	$1,511,486	1,428,869	$4,102,985	$5,614,471
2004/05	240	2,319	533,149	$1,270,898	1,637,229	$4,600,940	$5,871,838
2005/06	224	2,058	346,034	$974,884	1,434,845	$4,250,338	$5,225,222
2006/07	242	2,107	452,314	$1,327,408	1,357,072	$4,155,409	$5,482,817
2007/08	254	1,921	318,249	$914,222	1,339,664	$4,115,800	$5,030,021
2008/09	270	1,968	388,629	$1,066,824	1,458,016	$4,287,517	$5,354,341
2009/10	248	1,637	326,906	$848,990	1,147,186	$3,287,444	$4,136,434
2010/11	210	1,336	391,631	$1,022,432	903,470	$2,590,011	$3,612,444
2011/12	178	666	300,665	$644,100	324,237	$970,480	$1,614,580
2012/13	198	1,262	304,776	$886,002	747,860	$2,297,386	$3,183,388
2013/14	234	2,697	528,187	$1,552,294	1,532,890	$4,891,735	$6,444,028
Average	234	2,013	422,200	$1,094,059	1,301,842	$3,841,062	$4,935,121

Source: SEFSC Coastal Fisheries Logbook for weight and NMFS ALS for revenues, L. Perruso, pers. comm., 2015.

On average, the vessels that harvested black sea bass also took 3,759 trips per year without black sea bass landings. Combining all sources of revenues, the average annual dockside revenues of vessels that landed black sea bass was about $53,986 (2013 $) (**Table 3.3.1.6**). Annual dockside revenue from black sea bass landings represented, on average, approximately 9% of the total dockside revenue from all commercial landings from 2000/01 through 2013/14. Average annual dockside revenue per vessel from all landings was $53,986 as compared to $4,864 per vessel from black sea bass only. Dockside revenues from species caught and landed on trips without black sea bass were highest in 2011/12 while total dockside revenues from all species were highest in 2008/09.

Table 3.3.1.6. Dockside revenues (2013 $) from all sources for vessels that landed black sea bass, fishing years 2000/01–2013/14. **ALL GEARS.**

Year	Number vessels that landed black sea bass	Dockside revenue from black sea bass (2013 $)	Dockside revenue from 'other species' jointly landed with black sea bass (2013 $)	Dockside revenue from 'other species' landed on trips without black sea bass (2013 $)	Total dockside revenue (2013 $)	Average total dockside revenue per vessel (2013 $)
2000/01	248	$1,278,557	$4,485,103	$8,350,093	$14,113,753	$56,910
2001/02	250	$1,165,505	$5,546,695	$7,105,720	$13,817,919	$55,272
2002/03	235	$853,225	$4,193,030	$6,638,633	$11,684,889	$49,723
2003/04	239	$1,511,486	$4,102,985	$6,648,805	$12,263,276	$51,311
2004/05	240	$1,270,898	$4,600,940	$6,883,410	$12,755,247	$53,147
2005/06	224	$974,884	$4,250,338	$6,539,420	$11,764,642	$52,521
2006/07	242	$1,327,408	$4,155,409	$7,945,898	$13,428,715	$55,491
2007/08	254	$914,222	$4,115,800	$9,183,652	$14,213,674	$55,959
2008/09	270	$1,066,824	$4,287,517	$9,048,602	$14,402,943	$53,344
2009/10	248	$848,990	$3,287,444	$8,658,037	$12,794,471	$51,591
2010/11	210	$1,022,432	$2,590,011	$7,602,809	$11,215,253	$53,406
2011/12	178	$644,100	$970,480	$8,669,596	$10,284,176	$57,776
2012/13	198	$886,002	$2,297,386	$7,333,275	$10,516,662	$53,114
2013/14	234	$1,552,294	$4,891,735	$6,420,098	$12,864,127	$54,975
Average	234	$1,094,059	$3,841,062	$7,644,861	$12,579,982	$53,896

Source: SEFSC Coastal Fisheries Logbook for weight and NMFS ALS for revenues, L. Perruso, pers. comm., 2015.

From 2000/01 through 2013/14, an annual average of 45 vessels took 591 commercial trips using traps that combined landed an average of 348,952 lb gw of black sea bass annually with a

dockside value (2013 dollars) of $897,671 (**Table 3.3.1.7**). Average annual dockside revenue from black sea bass landings represented approximately 93% of total dockside revenue from trips that landed black sea bass from 2000/01 through 2013/14. This very high proportion indicates that vessels harvesting black sea bass using traps are highly dependent on black sea bass. Fishing year 2000/01 had the most number of vessels landing black sea bass using traps, but the highest black sea bass landings using traps occurred in 2003/04 and highest dockside revenues from black sea bass also occurred in 2003/04. Including revenues from black sea bass and other species jointly caught and landed with black sea bass, the highest total revenues occurred in 2003/04. The recent increase in the black sea bass ACL translated into a slight landings increase in 2013/14 for vessels using traps, despite a relative good increase in the number of trips. It is quite apparent that the November 1-April 30 ban on the use of traps for harvesting black sea bass constrained the landings of vessels that used traps.

Table 3.3.1.7. Vessels and trips with black sea bass landings by weight (lb gw) and dockside revenue (2013 $), fishing years 2000/01–2013/14. **TRAPS.**

Year	Number vessels that landed black sea bass	Number trips that landed black sea bass	Black sea bass landings (lb gw)	Dockside revenue from black sea bass (2013 $)	'Other species' landed and jointly caught with black sea bass (lb gw)	Dockside revenue from 'other species' from trips with black sea bass landings (2013 $)	Total dockside revenue (2013 $) from trips with black sea bass landings
2000/01	59	881	438,135	$1,100,732	61,015	$86,457	$1,187,188
2001/02	55	1,045	423,652	$994,401	81,912	$97,236	$1,091,636
2002/03	44	663	304,547	$715,649	60,634	$75,088	$790,737
2003/04	51	846	587,633	$1,355,015	39,404	$61,842	$1,416,857
2004/05	47	699	457,126	$1,088,347	41,773	$63,185	$1,151,532
2005/06	46	628	295,954	$839,219	47,763	$70,881	$910,099
2006/07	52	712	406,142	$1,193,016	58,937	$89,180	$1,282,196
2007/08	46	519	277,314	$796,999	51,582	$79,252	$876,251
2008/09	51	526	344,227	$945,912	41,655	$65,349	$1,011,261
2009/10	39	409	279,601	$722,645	47,146	$69,653	$792,299
2010/11	48	390	342,530	$895,796	28,293	$39,240	$935,036
2011/12	39	221	256,589	$550,520	10,928	$15,697	$566,216
2012/13	25	317	212,758	$615,397	20,213	$33,297	$648,694
2013/14	29	420	259,128	$753,742	22,701	$49,808	$803,550
Average	45	591	348,952	$897,671	43,854	$64,012	$961,682

Source: SEFSC Coastal Fisheries Logbook for weight and NMFS ALS for revenues, L. Perruso, pers. comm., 2015.

On average, the vessels that harvested black sea bass using traps also took 6 trips per year without black sea bass landings. Combining all sources of revenues, the average annual dockside revenues of vessels that landed black sea bass using traps was about $21,609 (2013 $) (**Table 3.3.1.8**). Annual dockside revenue from black sea bass landings represented, on average, approximately 93% of the total dockside revenue from all commercial landings from 2000/01 through 2013/14, indicating strong dependence of these vessels on black sea bass. Average annual dockside revenue per vessel from all landings was $21,609 as compared to $19,916 per vessel from black sea bass only. Dockside revenues from species caught and landed on trips without black sea bass were highest in 2003/04 and total dockside revenues from all species were also highest in 2003/04.

Table 3.3.1.8. Dockside revenues (2013 $) from all sources for vessels that landed black sea bass, fishing years 2000/01–2013/14. **TRAPS**.

Year	Number vessels that landed black sea bass	Dockside revenue from black sea bass (2013 $)	Dockside revenue from 'other species' jointly landed with black sea bass (2013 $)	Dockside revenue from 'other species' landed on trips without black sea bass (2013 $)	Total dockside revenue (2013 $)	Average total dockside revenue per vessel (2013 $)
2000/01	59	$1,100,732	$86,457	$2,896	$1,190,084	$20,171
2001/02	55	$994,401	$97,236	$3,194	$1,094,830	$19,906
2002/03	44	$715,649	$75,088	$2,602	$793,339	$18,030
2003/04	51	$1,355,015	$61,842	$7,225	$1,424,082	$27,923
2004/05	47	$1,088,347	$63,185	$1,766	$1,153,298	$24,538
2005/06	46	$839,219	$70,881	$6,935	$917,034	$19,936
2006/07	52	$1,193,016	$89,180	$2,740	$1,284,936	$24,710
2007/08	46	$796,999	$79,252	$8,419	$884,670	$19,232
2008/09	51	$945,912	$65,349	$2,042	$1,013,303	$19,869
2009/10	39	$722,645	$69,653	$2,216	$794,514	$20,372
2010/11	48	$895,796	$39,240	$237	$935,273	$19,485
2011/12	39	$550,520	$15,697	$0	$566,216	$14,518
2012/13	25	$615,397	$33,297	$3,885	$652,579	$26,103
2013/14	29	$753,742	$49,808	$638	$804,188	$27,731
Average	45	$897,671	$64,012	$3,200	$964,882	$21,609

Source: SEFSC Coastal Fisheries Logbook for weight and NMFS ALS for revenues, L. Perruso, pers. comm., 2015.

From 2000/01 through 2013/14, an annual average of 215 vessels took 1,422 commercial trips using other gear that combined landed an average of 73,247 lb gw of black sea bass

annually with a dockside value (2013 dollars) of $196,388 (**Table 3.3.1.9**). Average annual dockside revenue from black sea bass landings represented approximately 5% of total dockside revenue from trips that landed black sea bass from 2000/01 through 2013/14. It is worth noting, however, that this proportion was 14% for the 2013/14 fishing year. The average proportion indicates that vessels harvesting black sea bass using other gear are dependent on species other than black sea bass. Fishing year 2008/09 had the most number of vessels landing black sea bass using other gears, but the highest black sea bass landings and revenues from black sea bass using other gears occurred in 2013/14. Including revenues from black sea bass and other species jointly caught and landed with black sea bass, the highest total revenues occurred in 2013/14. The recent increase in the black sea bass ACL translated into a rather substantial landings increase in 2013/14 for vessels using other gear. Apparently, these vessels took advantage of the November 1-April 30 ban on the use of traps for harvesting black sea bass. Trips by vessels using other gear in harvesting black sea bass more than doubled in 2013/14 from the prior fishing year.

Table 3.3.1.9. Vessels and trips with black sea bass landings by weight (lb gw) and dockside revenue (2013 $), fishing years 2000/01–2013/14. **OTHER GEARS.**

Year	Number vessels that landed black sea bass	Number trips that landed black sea bass	Black sea bass landings (lb gw)	Dockside revenue from black sea bass (2013 $)	'Other species' landed and jointly caught with black sea bass (lb gw)	Dockside revenue from 'other species' from trips with black sea bass landings (2013 $)	Total dockside revenue (2013 $) from trips with black sea bass landings
2000/01	228	1,708	68,315	$177,825	1,440,111	$4,398,647	$4,576,472
2001/02	231	1,974	72,211	$171,104	1,846,536	$5,449,459	$5,620,563
2002/03	220	1,581	56,951	$137,577	1,424,239	$4,117,942	$4,255,519
2003/04	220	1,519	68,813	$156,471	1,389,466	$4,041,143	$4,197,614
2004/05	224	1,620	76,023	$182,551	1,595,456	$4,537,755	$4,720,306
2005/06	212	1,430	50,080	$135,666	1,387,082	$4,179,457	$4,315,123
2006/07	224	1,395	46,172	$134,392	1,298,135	$4,066,229	$4,200,621
2007/08	239	1,402	40,935	$117,222	1,288,082	$4,036,548	$4,153,770
2008/09	254	1,442	44,402	$120,912	1,416,361	$4,222,168	$4,343,080
2009/10	229	1,228	47,305	$126,345	1,100,039	$3,217,790	$3,344,135
2010/11	183	946	49,101	$126,636	875,177	$2,550,771	$2,677,408
2011/12	153	445	44,076	$93,581	313,310	$954,783	$1,048,364
2012/13	174	945	92,018	$270,605	727,647	$2,264,089	$2,534,693
2013/14	222	2,277	269,059	$798,552	1,510,190	$4,841,927	$5,640,478
Average	215	1,422	73,247	$196,388	1,257,988	$3,777,051	$3,973,439

Source: SEFSC Coastal Fisheries Logbook for weight and NMFS ALS for revenues, L. Perruso, pers. comm., 2015.

On average, the vessels that harvested black sea bass using other gears also took 3,684 trips per year without black sea bass landings. Combining all sources of revenues, the average annual dockside revenues of vessels that landed black sea bass using other gears was $53,779 (2013 $) (**Table 3.3.1.10**). Annual dockside revenue from black sea bass landings represented, on average, approximately 2% of the total dockside revenue from all commercial landings from 2000/01 through 2013/14. In 2013/14, this proportion was about 7%. Average annual dockside revenue per vessel from all landings was $53,779 as compared to $913 per vessel from black sea bass only. Dockside revenues from species caught and landed on trips without black sea bass were highest in 2007/08 and total dockside revenues from all species were highest in 2008/09.

Table 3.3.1.10. Dockside revenues (2013 $) from all sources for vessels that landed black sea bass, fishing years 2000/01–2013/14. **OTHER GEARS**.

Year	Number vessels that landed black sea bass	Dockside revenue from black sea bass (2013 $)	Dockside revenue from 'other species' jointly landed with black sea bass (2013 $)	Dockside revenue from 'other species' landed on trips without black sea bass (2013 $)	Total dockside revenue (2013 $)	Average total dockside revenue per vessel (2013 $)
2000/01	228	$177,825	$4,398,647	$8,273,088	$12,849,560	$56,358
2001/02	231	$171,104	$5,449,459	$7,037,642	$12,658,205	$54,797
2002/03	220	$137,577	$4,117,942	$6,616,611	$10,872,130	$49,419
2003/04	220	$156,471	$4,041,143	$6,630,744	$10,828,358	$49,220
2004/05	224	$182,551	$4,537,755	$6,856,488	$11,576,793	$51,682
2005/06	212	$135,666	$4,179,457	$6,528,495	$10,843,618	$51,149
2006/07	224	$134,392	$4,066,229	$7,942,298	$12,142,919	$54,209
2007/08	239	$117,222	$4,036,548	$9,145,699	$13,299,470	$55,646
2008/09	254	$120,912	$4,222,168	$9,007,804	$13,350,884	$52,563
2009/10	229	$126,345	$3,217,790	$8,587,857	$11,931,992	$52,105
2010/11	183	$126,636	$2,550,771	$7,368,545	$10,045,952	$54,896
2011/12	153	$93,581	$954,783	$8,423,689	$9,472,053	$61,909
2012/13	174	$270,605	$2,264,089	$6,989,299	$9,523,993	$54,736
2013/14	222	$798,552	$4,841,927	$6,394,837	$12,035,316	$54,213
Average	215	$196,388	$3,777,051	$7,557,364	$11,530,803	$53,779

Source: SEFSC Coastal Fisheries Logbook for weight and NMFS ALS for revenues, L. Perruso, pers. comm., 2015.

Vessel Level Landings and Dockside Revenues for Black Sea Bass: Endorsement Holders Using Traps

The following describes the performance of vessels used by endorsement holders for the period 2000/01 through 2013/14. The trap endorsement system was implemented in 2012, so data for earlier years was generated by tracking back in the time the trips and catches made by vessels used by endorsement holders (SERO-LAPP-2014-09). This dataset was merged with the logbook-based dataset provided by SEFSC (L. Perruso, pers. comm., 2015) to generate the corresponding revenue information. Only vessels using traps are included, so trips made by the same vessels using other gear or trips that did not harvest black sea bass are excluded. At this time, the following information may be considered preliminary.

From 2000/01 through 2013/14, an annual average of 26 vessels took 322 commercial trips using traps that combined landed an average of 269,593 lb gw of black sea bass annually with a dockside value (2013 dollars) of $702,554 (**Table 3.3.1.11**). These vessels also caught other species jointly with black sea bass at an annual average of 38,513 lb gw with a dockside value of $64,779. Fishing years 2001/02 and 2006/07 had the most number of vessels landing black sea bass, but the most number of trips occurred in 2006/07. The highest black sea bass landings occurred in 2003/04 but the highest dockside revenues from black sea bass was in 2006/07. In the last three fishing years (2011/13-2013/14), landings and revenues from black sea bass were below the average for the entire period.

Table 3.3.1.11. Vessels and trips with black sea bass landings by weight (lb gw) and dockside revenue (2013 $), fishing years 2000/01–2013/14. **ENDORSEMENT HOLDERS, TRAPS.**

Year	Number vessels that landed black sea bass	Number trips that landed black sea bass	Black sea bass landings (lb gw)	Dockside revenue from black sea bass (2013 $)	'Other species' landed and jointly caught with black sea bass (lb gw)	Dockside revenue from 'other species' from trips with black sea bass landings (2013 $)	Total dockside revenue (2013 $) from trips with black sea bass landings
2000/01	24	455	233,235	$574,467	34,500	$51,376	$625,843
2001/02	30	592	255,452	$599,622	45,478	$61,076	$660,698
2002/03	25	452	202,041	$474,144	37,212	$55,788	$529,932
2003/04	25	602	397,108	$913,619	30,406	$48,691	$962,311
2004/05	25	553	379,401	$906,655	42,936	$77,530	$984,185
2005/06	27	535	257,350	$730,926	51,608	$87,830	$818,756

2006/07	30	620	362,955	$1,065,614	60,195	$98,518	$1,164,132
2007/08	27	435	233,560	$679,328	57,304	$105,556	$784,884
2008/09	29	437	278,478	$775,194	42,832	$73,119	$848,314
2009/10	23	367	250,966	$640,010	45,704	$75,372	$715,382
2010/11	26	348	304,741	$793,580	26,645	$39,149	$832,729
2011/12	22	148	181,852	$415,339	8,806	$14,100	$429,439
2012/13	26	322	213,510	$617,664	23,727	$46,343	$664,007
2013/14	27	366	223,655	$649,596	31,835	$72,462	$722,058
Average	26	445	269,593	$702,554	38,513	$64,779	$767,333

Source: SEFSC Coastal Fisheries Logbook for weight and NMFS ALS for revenues, L. Perruso, pers. comm., 2015; SERO-LAPP, 2015.

Combining all sources of revenues, the average annual dockside revenues of vessels that landed black sea bass using traps was $29,253 (2013 $) (**Table 3.3.1.12**). Absent in the table are the revenues from trips where no black sea bass were caught. No attempt at this time is made to generate the information, although in all likelihood such trips occurred.

Table 3.3.1.12. Dockside revenues (2013 $) from all sources for vessels that landed black sea bass, fishing years 2000/01–2013/14. **ENDORSEMENT HOLDERS, TRAPS**.

Year	Number vessels that landed black sea bass	Dockside revenue from black sea bass (2013 $)	Dockside revenue from 'other species' jointly landed with black sea bass (2013 $)	Dockside revenue from 'other species' landed on trips without black sea bass (2013 $)	Total dockside revenue (2013 $)	Average total dockside revenue per vessel (2013 $)
2000/01	24	$574,467	$51,376	$0	$625,843	$26,077
2001/02	30	$599,622	$61,076	$0	$660,698	$22,023
2002/03	25	$474,144	$55,788	$0	$529,932	$21,197
2003/04	25	$913,619	$48,691	$0	$962,311	$38,492
2004/05	25	$906,655	$77,530	$0	$984,185	$39,367
2005/06	27	$730,926	$87,830	$0	$818,756	$30,324
2006/07	30	$1,065,614	$98,518	$0	$1,164,132	$38,804
2007/08	27	$679,328	$105,556	$0	$784,884	$29,070
2008/09	29	$775,194	$73,119	$0	$848,314	$29,252
2009/10	23	$640,010	$75,372	$0	$715,382	$31,104
2010/11	26	$793,580	$39,149	$0	$832,729	$32,028
2011/12	22	$415,339	$14,100	$0	$429,439	$19,520

2012/13	26	$617,664	$46,343	$0	$664,007	$25,539
2013/14	27	$649,596	$72,462	$0	$722,058	$26,743
Average	26	$702,554	$64,779	$0	$767,333	$29,253

Source: SEFSC Coastal Fisheries Logbook for weight and NMFS ALS for revenues, L. Perruso, pers. comm., 2015; SERO-LAPP, 2015.

3.3.2 Economic Description of the Recreational Sector

The following focuses on recreational landings and effort (angler trips) for black sea bass. The major sources of data summarized in this description are the Recreational ACL Dataset (SEFSC MRIPACLspec_rec81_13wv6_21Feb14), as summarized by SERO-LAPP, for landings and the NOAA fisheries website for accessing recreational data (**http://www.st.nmfs.noaa.gov/recreational-fisheries/access-data/run-a-data-query/index)** for effort. The 2013 data are preliminary or incomplete, including the unavailability of the 2013 headboat landings. Additional information on the recreational sector of the snapper grouper fishery contained in previous or concurrent amendments is incorporated herein by reference [see Amendment 13C (SAFMC 2006), Amendment 15A (SAFMC 2008a), Amendment 15B (SAFMC 2008b), Amendment 16 (SAFMC 2009a), Amendment 17A (SAFMC 2010a), Amendment 17B (SAFMC 2010b), Regulatory Amendment 9 (SAFMC 2011a), Regulatory Amendment 11 (SAFMC 2011b), Comprehensive ACL Amendment for the South Atlantic Region (SAFMC 2011c), and Amendment 24 (SAFMC 2011d)].

The 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 charter boat and headboat (also called partyboat) sectors. Charter boats generally carry fewer passengers and charge a fee on an entire vessel basis, whereas headboats carry more passengers and payment is per person.

Harvest

The private/rental mode was the dominant sector in the harvest for black sea bass, followed by headboats, charter boats, and shore mode (**Table 3.3.2.1**). This is true for recreational landings in the South Atlantic and in other states. The annual trend of recreational black sea bass landings was not uniform across fishing modes during 2009/10-2012/13. Landings were highest in 2009/10 for all fishing modes, except headboats whose highest landings occurred in 2010/11. In the mid- and North Atlantic, landings peaked in 2012/13 for the headboats and charter boats. The other modes recorded their highest landings in 2011/11 for the private mode and in 2009/10 for the shore mode. Quite apparent in **Table 3.3.2.1** is that for each fishing mode the mid- and North Atlantic dominated their counterparts in the South Atlantic.

Among the states in the South Atlantic, Florida dominated all other states in the harvest for black sea bass in 2010/11 and 2011/12; South Carolina was the dominant state in 2009/10 and

2012/13; and, North Carolina had higher landings than Florida in 2012/13 (**Table 3.3.2.2**). Again some caution has to be recalled here regarding the incompleteness of the 2013 landings. Every year from 2009/10 through 2012/13, the Northern states recorded more landings than the combined landings of the four South Atlantic states.

Seasonality is quite apparent in black sea bass recreational landings (**Figure 3.3.2.1**). Landings peaked at the start of the fishing season, declined in the next two waves, and picked up again in March/April. The main reason July/August recorded higher landings than June is the two-month composition of this wave. Seasonality could be partly due to the opening and closing dates of the fishing season.

Table 3.3.2.1. Black sea bass recreational landings (lb ww) by mode, fishing year 2009/10–2012/13.

	Charter	Headboat	Private	Shore	Total
South Atlantic					
2009/10	123,016	209,720	402,828	5,189	740,754
2010/11	107,744	253,604	207,537	2,147	571,033
2011/12	100,907	201,957	334,139	1,309	638,312
2012/13	48,425	95,669	237,572	1,940	383,605
Average	95,023	190,238	295,519	2,646	583,426
Mid- and North Atlantic (NE)					
2009/10	292,747	255,840	2,081,436	26,638	2,656,660
2010/11	194,140	355,062	2,320,994	7,587	2,877,782
2011/12	238,469	285,894	1,012,176	13,461	1,550,000
2012/13	485,581	433,792	1,787,764	13,817	2,720,954
Average	302,734	332,647	1,800,592	15,376	2,451,349

Source: SEFSC MRIPACLspec_rec81_13wv6_21Feb14; SERO-LAPP, 2014.
Note: Landings for 2013 are incomplete and headboat landings for 2013 are not yet available.

Table 3.3.2.2. Black sea bass recreational landings (lb ww) by state, fishing year 2009/10–2012/13.

	FL	GA	SC	NC	NE	Total
2009/10	232,928	32,169	285,718	189,940	2,656,660	3,397,414
2010/11	221,968	41,436	156,218	151,410	2,877,782	3,448,815
2011/12	246,449	48,748	179,657	163,458	1,550,000	2,188,312
2012/13	106,209	13,548	138,706	125,143	2,720,954	3,104,560
Average	201,888	33,975	190,075	157,488	2,451,349	3,034,775

Source: SEFSC MRIPACLspec_rec81_13wv6_21Feb14; SERO-LAPP, 2014.
Note: Landings for 2013 are incomplete and headboat landings for 2013 are not yet available.

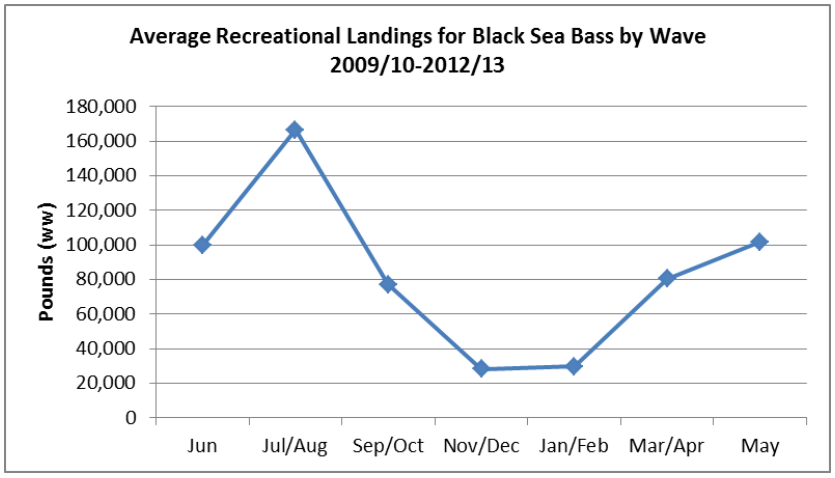

Figure 3.3.2.1. South Atlantic average recreational landings for black sea bass by wave, fishing year 2009/10-2012/13.
Source: SEFSC MRIPACLspec_rec81_13wv6_21Feb14; SERO-LAPP, 2014.
Note: Landings for 2013 are incomplete and headboat landings for 2013 are not yet available.

Effort

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

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

The source of the following target and catch trips is NOAA fisheries website for accessing recreational data: **http://www.st.nmfs.noaa.gov/recreational-fisheries/access-data/run-a-data-query/index**.

Estimates of target and catch effort for black sea bass by fishing mode are presented in **Table 3.3.2.3** and those by state are shown in **Table 3.3.2.4**. Clearly apparent in these tables is the substantial difference between target and catch trips, with target trips being generally less than 10 percent (significantly less for some modes) of catch trips. The private mode dominated in both target and catch trips. The charter mode reported higher target trips but lower catch trips than the shore mode. On average, North Carolina recorded the highest target and catch trips, followed by South Carolina for target trips and Florida for catch trips.

Similar to harvests and likely for the same reasons, there is an apparent seasonality of both target and catch trips for black sea bass (**Figure 3.3.2.2**). Catch trips peaked in July/August, declined thereafter through January/February, and picked up in the next two waves. This is the same pattern as that for harvests shown in **Figure 3.3.2.1**. Target trips followed almost the same pattern from wave to wave, except that they troughed in November/December.

Table 3.3.2.3. Target and catch trips for black sea bass in the South Atlantic by fishing mode, fishing year 2009/10-2012/13.

	Charter	Private	Shore	Total
Target Trips				
2009/10	2,185	30,062	404	32,652
2010/11	2,153	37,383	648	40,184
2011/12	506	44,063	175	44,744
2012/13	31	26,895	0	26,926
Average	1,219	34,601	307	36,126
Catch Trips				
2009/10	30,613	381,891	98,925	511,429
2010/11	35,245	450,206	99,899	585,350
2011/12	34,767	542,699	119,211	696,677
2012/13	21,283	464,412	87,706	573,401
Average	30,477	459,802	101,435	591,714

Table 3.3.2.4. Target and catch trips for black sea bass in the South Atlantic by state, fishing year 2009/10-2012/13.

	FL	GA	NC	SC
Target Trips				
2009/10	7,411	2,016	14,627	8,597
2010/11	11,444	3,755	16,876	8,512
2011/12	12,247	4,687	15,055	13,403
2012/13	2,974	526	9,526	13,900
Average	8,519	2,746	14,021	11,103
Catch Trips				
2009/10	157,848	38,677	214,857	100,047
2010/11	211,034	46,255	243,760	84,301
2011/12	275,153	43,059	264,399	114,066
2012/13	175,076	38,048	262,819	97,457
Average	204,778	41,510	246,459	98,968

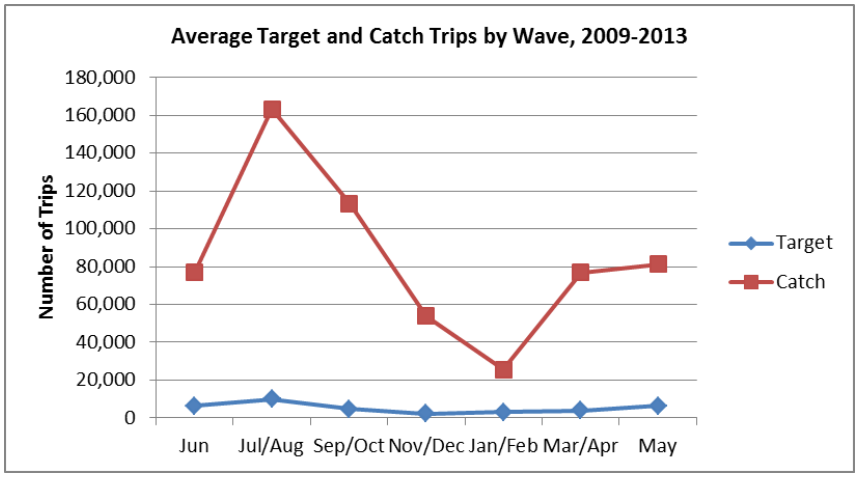

Figure 3.3.2.2. South Atlantic average target and catch trips by wave, fishing year 2009//10-2012/13.

Similar analysis of recreational effort is not possible for the headboat sector because headboat data are not collected at the angler level. Estimates of effort in the headboat sector are provided in terms of angler days, or the number of standardized 12-hour fishing days that account for the different half-, three-quarter-, and full-day fishing trips by headboats. **Table 3.3.2.5** displays the annual angler days by state for 2009/10-2012/13 and **Table 3.3.2.6** displays their average (2009/10-2012/13) monthly distribution. Confidentiality issues required combining Georgia estimates with those of Northeast Florida.

Headboat angler days (trips) varied from year to year across various states. Total headboat angler trips fell followed a see-saw pattern, increasing in 2010/11, falling in the next year, and increasing the following year (**Table 3.3.2.5**). Southeast Florida registered the highest number of angler trips, followed by Georgia/Northeast Florida, South Carolina, and North Carolina. Clearly Florida dominated all other states in terms of headboat angler days.

On average (2009/10-2012/13), overall angler days peaked in July and troughed in November (**Table 3.3.2.6**). All states recorded peak angler trips in July, similar to the overall peak month. None of the states, however, had the same trough month as the overall angler trips. North Carolina had a trough in February, South Carolina in January, Georgia/Northeast Florida in November, and Southeast Florida in October.

Table 3.3.2.5. South Atlantic headboat angler days, by state, fishing year 2009/10-2012/13.

	2009/10	2010/11	2011/12	2012/13	AVERAGE
NC	19,353	20,325	18,656	20,402	19,684
SC	40,703	46,175	44,126	39,510	42,629
GA/NEFL	61,108	50,859	31,239	28,509	42,929
SEFL	67,457	76,613	99,466	111,665	88,800
TOTAL	188,621	193,972	193,487	200,086	194,042

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

Table 3.3.2.6. Average monthly distribution of headboat angler days in the South Atlantic, by state, fishing year 2009/10-2012/13.

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
NC	3,978	4,605	3,574	2,059	1,794	320	3	15	0	175	898	2,263
SC	9,081	11,401	8,239	3,382	2,283	583	107	44	97	1,098	2,834	3,481
GA/NEFL	6,909	7,277	4,576	2,531	2,312	1,526	2,030	1,673	1,917	3,341	4,228	4,610
SEFL	8,998	10,371	7,524	4,545	3,806	4,559	6,223	6,609	7,406	9,974	9,920	8,867
TOTAL	28,965	33,654	23,913	12,517	10,194	6,987	8,363	8,340	9,420	14,588	17,879	19,221

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

Economic Values and For-Hire Vessel Financials

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

The NMFS Southeast Science Center (Carter and Liese 2012) developed estimates of consumer surplus per fish, per angler trip. These estimates were culled from various studies – Haab *et al.* (2009), Dumas *et al.* (2009), and NOAA SEFSC SSRG (2009). The values/ranges of consumer surplus estimates are (in 2013 dollars) $121 to $139 for red snapper, $134 to $139 for grouper, $11.9 for other snappers, and $87 for snapper grouper. Haab *et al.* (2009) also estimated consumer surplus for snapper in general to range from $12 to $34 (2013 dollars) for one additional fish caught and kept.

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 (Christopher Liese, NMFS SEFSC, personal communication, August 2010). These estimates were culled from several studies – Liese *et al.* (2009), Dumas *et al.* (2009), Holland *et al.* (1999), and Sutton *et al.* (1999). Estimates of net operating revenue per angler trip (2013 dollars) on representative charter trips (average charter trip regardless of area fished) are $158 for Louisiana through east Florida, $147 for east Florida, $170 for northeast Florida, and $139 for North Carolina. For charter trips into the EEZ only, net operating revenues are $153 in east Florida and $161 in northeast Florida. For full-day and overnight trips only, net operating revenues are estimated to be $169-$174 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 charter boats. Net operating revenue estimates (2013 dollars) for a representative headboat trip are $52 in the Gulf of Mexico (all states and all of Florida), and $68-$74 in North Carolina. For full-day and overnight headboat trips, net operating revenues are estimated to be $81-$84 in North Carolina. Comparable estimates are not available for Georgia and South Carolina.

A study of the North Carolina for-hire fishery provides some information on the financial status of the for-hire fishery in the state (Dumas *et al.* 2009). Depending on vessel length, regional location, and season, charter fees per passenger per trip ranged from $182.58 to $273.20 for a full-day trip and from $101.70 to $134.63 for a half-day trip; headboat fees ranged from $78.71 to $88.75 for a full-day trip and from $41.32 to $46.60 for a half-day trip. Charter boats generated a total of $60.48 million in passenger fees, $3.5 million in other vessel income (e.g., food and beverages), and $5.2 million in tips. The corresponding figures for headboats were $10.67 million in passenger fees, $0.22 million in other vessel income, and $0.97 million in tips. Non-labor expenditures (e.g., boat insurance, dockage fees, bait, ice, fuel) amounted to $46.6 million for charter boats and $5.8 million for headboats. Summing across vessel lengths and regions, charter vessels had an aggregate value (depreciated) of $130.70 million and headboats had an aggregate value (depreciated) of $11.08 million. All these values are in 2013 dollars.

A more recent study of the for-hire sector provides estimates on gross revenues generated by the charter boats and headboats in the South Atlantic (Holland *et al.* 2012). Average annual revenues (2013 dollars) per charter boat are estimated to be $130,524 for Florida vessels, $55,348 for Georgia vessels, $104,417 for South Carolina vessels, and $105,593 for North Carolina vessels. For headboats, the corresponding per vessel estimates are $216,975 for Florida vessels and $159,332 for vessels in the other states.

3.3.3 Social and Cultural Environment

Black sea bass are commercially harvested using a variety of gear including hook and line gear and pots. The majority of commercial harvest is landed using pot gear off the coasts of North and South Carolina. In the recent Amendment 18A, the Council implemented restrictions on the number of pots (35) and a prohibition on overnight soaking of pots (leaving them in the

water). These were considered to be viable alternatives to reduce interactions with marine mammals (SAFMC 2011).

In addition, Amendment 18A added an endorsement to limit participation in the pot sector, reducing the number of active fishermen from approximately 55-60 (SAFMC 2011) to 32 valid or renewable endorsements. Currently, 15 endorsements are associated with communities in North Carolina, 9 endorsements with communities in South Carolina, and 8 endorsements with Florida communities. Most of the North Carolina endorsements are associated with areas in Onslow County, primarily Sneads Ferry, with other communities with black sea bass pot fishermen in Carteret County and further north into the Outer Banks (Wanchese) (see **Figure 3.3.1**). In South Carolina, communities associated with black sea bass pot fishing include Little River, Georgetown, and Charleston. The Florida communities of note include several communities north of Cape Canaveral, including Port Orange, Ormond Beach, and Ponce Inlet. Of the 32 endorsements issued, only five endorsements have been transferred from the original 86ssue to a different snapper grouper permit holder.

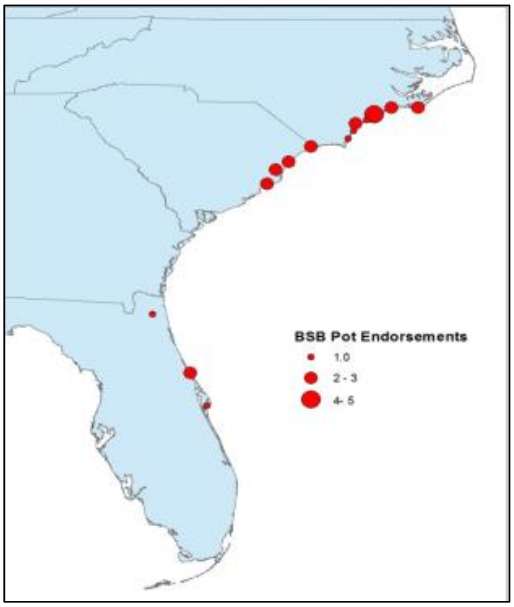

Figure 3.3.3.1. Black sea bass pot endorsements by homeport community.
Source: SERO Permits 2013

Black sea bass is part of the larger snapper grouper complex and while this species is harvested commercially using several different gear types, the proposed regulatory action within this amendment will primarily affect commercial black sea bass pot fishermen, with some indirect effects for black sea bass fishermen using other types of gear.

Figure3.3.3.2 shows South Atlantic the top fishing communities by the combined vessel local quotient (LQ). The vessel LQ is a measure of the proportion of an individual vessel's total landings of one species (in this case, black sea bass) in a fishing year compared to landings of all species in that year. An individual vessel LQ illustrates if a species is a large part of a vessel's catch, which can indicate that the vessel (and associated captain, owner, crew, fish house) is relatively more reliant on a species. For **Figure 3.3.3.2**, the vessel LQs in each community are combined to allow for a comparison among communities, and to show how vessels' reliance in a community on black sea bass has changed in recent years.

Figure 3.3.3.2 suggests that the communities of Sneads Ferry, North Carolina; Georgetown, South Carolina; and Little River, South Carolina, have vessels with relatively higher reliance on black sea bass harvested with pots within the region over the last few years. It should be noted that **Figure 3.3.3.2** also shows how the combined vessel LQs for a community changed after the endorsement program was implemented. Sneads Ferry, Georgetown and Little River have almost always been the top three communities, while most other communities have fluctuated. In particular, the graph shows that Ponce Inlet, Florida, and Cape Carteret, North Carolina, have increased combined vessel LQs over recent years, suggesting growth in one or several black sea bass pot businesses in those communities.

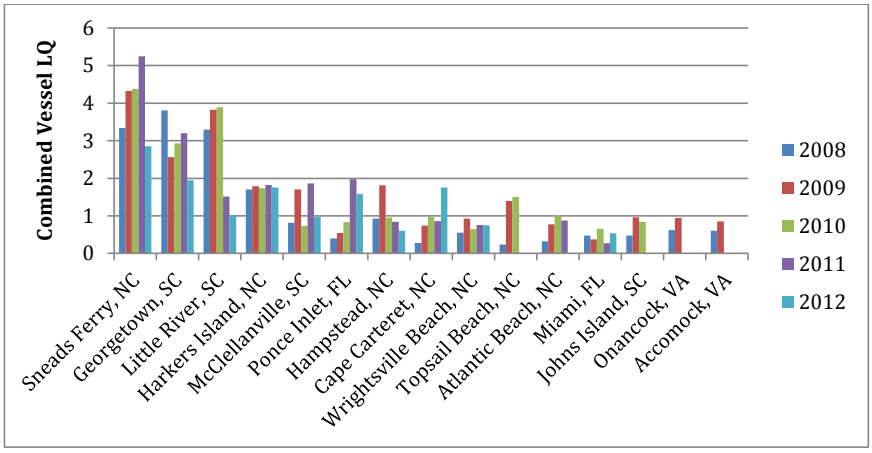

Figure 3.3.3.2. Combined vessel local quotients (LQs) for black sea bass harvested with pots in the top communities for 2008-2012.
Source:

Figure 3.3.3.3 shows the combined vessel LQs for black sea bass harvested with bandit gear in the top communities in recent years. This figure illustrates how communities may compare to one another in terms of reliance on black sea bass hook and line fishing, and how this has changed over the past few years. Communities in North Carolina and South Carolina are dominant in the region for black sea bass harvest with bandit gear, particularly Little River,

South Carolina. **Figure 3.3.3.3** also suggests growth in black sea bass harvest with bandit gear for fishing businesses in several communities since the pot endorsement program began.

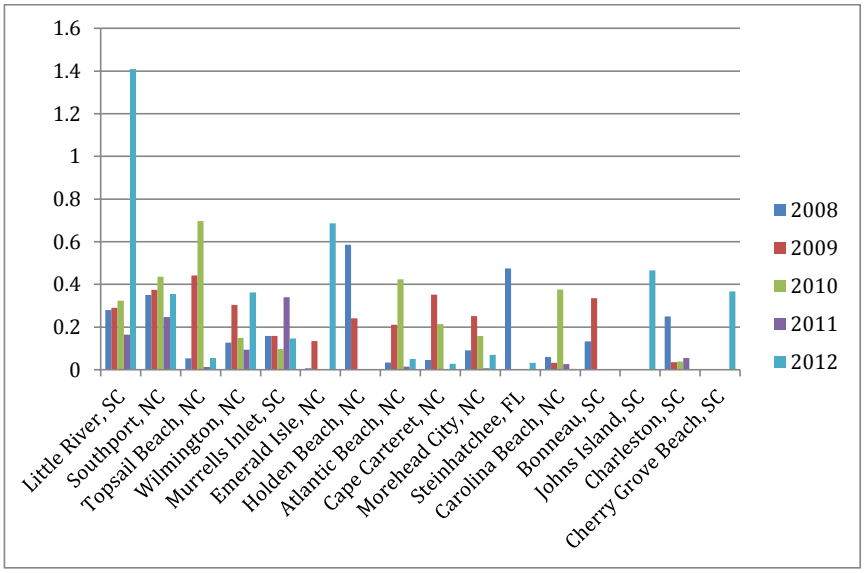

Figure 3.3.3.3. Combined vessel local quotients (LQs) for black sea bass harvested with bandit gear in the top communities for 2008-2012.
Source:

Commercial Fishing Engagement and Reliance

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

Several indices composed of existing permit and landings data were created to provide a more empirical measure of fishing dependence (Jacob et al. 2012; Colburn and Jepson 2013; Jepson and Colburn 2013). Fishing engagement uses the absolute numbers of permits, landings and value, while fishing reliance includes many of the same variables as engagement, but divides by population to give an indication of the per capita impact of this activity.

Using a principal component and single solution factor analysis each community receives a factor score for each index to compare to other communities. Factor scores are represented by

colored bars and are standardized, therefore the mean is zero. Two thresholds of 1 and ½ standard deviation above the mean are plotted onto the graphs to help determine thresholds for significance. Because the factor scores are standardized, a score above 1 is also above one standard deviation.

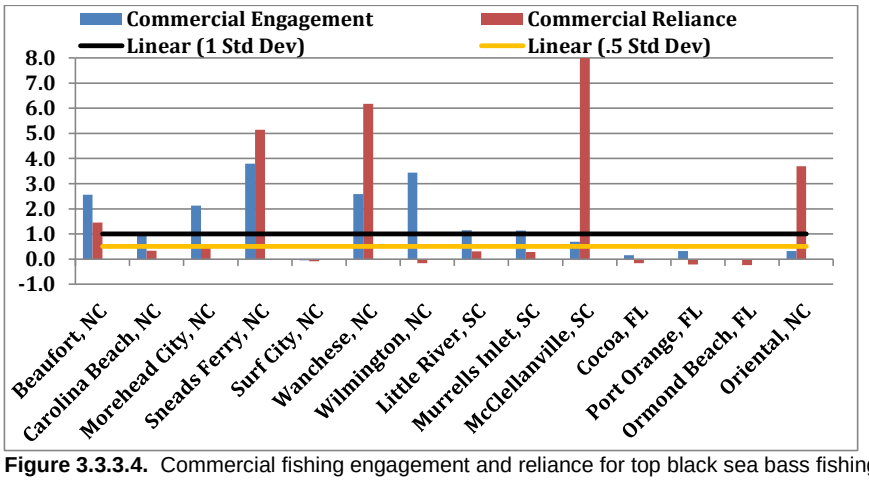

Figure 3.3.3.4. Commercial fishing engagement and reliance for top black sea bass fishing communities. Source: SERO Social Indicator Database 2013

The communities included in **Figures 3.3.3.4** have varying combinations of reliance and engagement. The communities of Beaufort, Sneads Ferry and Wanchese, North Carolina are considered likely dependent upon fishing overall as they exceed both thresholds for fishing reliance and engagement measures. Other communities might be considered commercially engaged as they exceed the highest threshold for commercial engagement. Those communities are: Morehead City, and Wilmington, North Carolina; Little River and Murrell's Inlet, South Carolina. Finally, communities like McClellanville, South Carolina and Oriental are commercially reliant as they exceed the highest threshold for commercial reliance.

Broader Affected Social Environment

In addition to fishermen and fishing communities as part of the social environment, this amendment may also have a broader Affected Social Environment because it addresses protection of North Atlantic right whales, which are protected under two federal laws, the MMPA and ESA. The mandates and authority under these laws were established with the end-goal that protection of these species is important to U.S. citizens and society. Specifically, the MMPA states that:

> ..marine mammals have proven themselves to be resources of **great international significance, esthetic and recreational as well as economic,** and it is the sense of the Congress that they should be protected and encouraged to develop to the greatest extent feasible commensurate with sound policies of resource management and that the primary objective of their management should be to maintain the health and

> stability of the marine ecosystem. (16 U.S. Code § 1361) (emphasis added)

The ESA also includes language that states:

> …these species of fish, wildlife, and plants are **of esthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people**;
>
> …encouraging the States and other interested parties, through Federal financial assistance and a system of incentives, to develop and maintain conservation programs which meet national and international standards is a key to meeting the Nation's international commitments and to better safeguarding, **for the benefit of all citizens**, the Nation's heritage in fish, wildlife, and plants. (16 U.S. Code § 1531) (emphasis added)

Therefore, the United States and its citizens are included in the social environment for purposes of analysis of potential social effects in **Section 4.3**.

3.3.4 Environmental Justice

In order to assess whether a community may be experiencing EJ issues, a suite of indices created to examine the social vulnerability of coastal communities (Colburn and Jepson 2012; Jacob et al. 2012) is presented in **Figure 3.3.4.1**. The three indices are poverty, population composition, and personal disruptions. The variables included in each of these indices have been identified through the literature as being important components that contribute to a community's vulnerability. Indicators such as increased poverty rates for different groups, more single female-headed households and children under the age of 5, disruptions such as higher separation rates, higher crime rates, and unemployment all are signs of vulnerable populations. These indicators are closely aligned to previously used measures of EJ, which used thresholds for the number of minorities and those in poverty, but are more comprehensive in their assessment. Again, for those communities that exceed the threshold it would be expected that they would exhibit vulnerabilities to sudden changes or social disruption that might accrue from regulatory change. It should be noted that some communities may not appear in these figures as there are no census data available to create the indices.

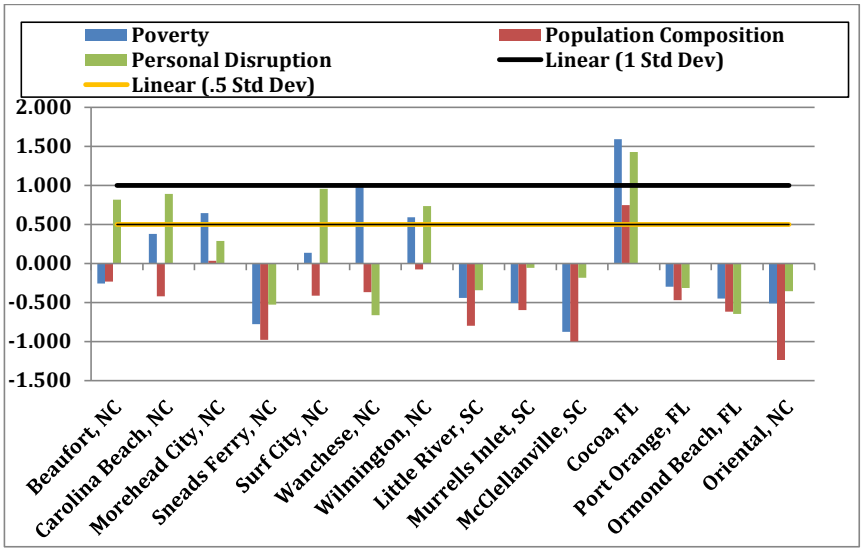

Figure 3.3.4.1. Social Vulnerability indices for black sea bass fishing communities in terms of pounds and value regional quotient in the South Atlantic.
Source: SERO Social Indicator Database 2014

There is one community in **Figure 3.3.4.1** that exceeds both thresholds for at least two indices: Cocoa, Florida. Wilmington, North Carolina, exceeds the lower threshold for poverty and personal disruption, with a few other communities exceeding the lower threshold for one or the other: Beaufort, Carolina Beach, Morehead City and Wanchese, North Carolina. While most communities in **Figure 3.4.4.1** are not experiencing much social vulnerability, there could still be some negative social effects that are exacerbated by other vulnerabilities that occur but are not represented by these indicators. However, these measures of social vulnerability are representative of many common social vulnerability factors.

Finally, the general participatory process used in the development of fishery management measures (e.g., scoping meetings, public hearings, and open South Atlantic Council meetings) 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. Public input from individuals who participate in the fishery has been considered and incorporated into management decisions throughout development of the amendment.

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

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

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

Public interests also are involved in the fishery management process through participation on Advisory Panels and through council meetings, which, with few exceptions for discussing personnel matters, are open to the public. The South Atlantic Council uses its SSC to review the data and science being used in assessments and fishery management plans/amendments. In

addition, the regulatory process is in accordance with the Administrative Procedure Act, in the form of "notice and comment" rulemaking.

3.5.1.2 State Fishery Management

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

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

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

3.5.1.3 Enforcement

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

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

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

Chapter 4. Environmental Consequences and Comparison of Alternatives

4.1 Action 1

4.1.1 Biological Effects

Black Sea Bass

The alternatives range from maintaining the current prohibition on use of black sea bass pots, annually, from November 1 through April 30 (**Alternative 1 (No Action)**) to allowing the pot fishery to operate based on varying spatial and seasonal closures. **Alternative 2** would prohibit black sea bass pots within the currently designated northern right whale critical habitat, annually, from November 15 through April 15. **Alternatives 3-6** include various areas in which use of black sea bass pots would be prohibited, annually, from November 1 through April 30. **Alternative 7** combines the currently designated northern right whale critical habitat with additional area off the Carolinas and northern Georgia and has three sub-alternatives that would close the areas for differing times. **Alternative 8** combines the area closure for Florida and Georgia in **Alternative 5** with the area closure for North Carolina and South Carolina from **Alternative 8** with a shortened closed season. **Alternative 9** combines **Alternative 5** for the closure off Florida and Georgia, **Sub-Alterative 7b** for the closure off North Carolina and South Carolina based on the 20 m depth contour from November 1 through x, and **Alternative 8** for the closure off North Carolina and South Carolina based on the 25 m depth contour from x through April 30.

Action 1 Alternatives[1]

(preferred alternatives in bold)

1. No action. Closure would remain.
2. Closure of the currently designated North Atlantic right whale critical habitat area Nov 15 – April 15.
3. Closure from Nov 1 – April 30 between Ponce Inlet, FL and Cape Hatteras, NC based on extrapolated model outputs.
4. Closure from Nov 1 – April 30 in depths 25 m or shallower from C. Canaveral to Savannah and 30 m or shallower from Savannah to C. Hatteras.
5. Closure from Nov 1 – April 30 between C. Canaveral & C. Hatteras based on NGO comments.
6. Closure from Nov 1 – April 30 between Sebastian, FL & C. Hatteras, NC based on NGO comments.
7. Closure of the currently designated North Atlantic right whale critical habitat area & north to C. Hatteras in depths 25 m or shallower
   7a. Nov 1 – Dec 15 & Mar 15 – Apr 30
   7b. Off NC/SC Nov 1 – Dec 15/Mar 15 – April 30 and off FL/GA Nov 15 – April 15
   7c. Off NC/SC Feb 15 – Apr 30. Off FL/GA Nov 15 – Apr 15.
8. Hybrid of alternatives 5 & 8
9. Hybrid of alternatives 5, 7b & 8
10.

[1]See Chapter 2 for a more detailed description of the alternatives.

The expected closure date ranges and the estimated percent of the commercial black sea bass ACL expected to be harvested are shown in **Table 4.1.1.1**. The ranges of closing

dates and expected percentages of the commercial ACL that would be landed are due to different scenarios considered in the analyses (SERO-LAPP-2014-09; included as **Appendix X**). The scenarios considered various combinations of the spatial distribution of landings and effort, and factors that affected catch rate projections.

Regardless of which alternative the South Atlantic Council chooses, no biological impacts to the black sea bass stock are expected. Adverse effects are prevented because overall harvest in the commercial sector is limited to the commercial ACL; commercial accountability measures are also in place. The ACL is reduced from the overfishing level as required to address assessment uncertainty. In addition, there is no evidence to suggest that changing the timing of harvest within the periods covered by the alternatives would have adverse biological impacts. These alternatives are predicted to harvest 97-100% of the ACL and would not provide additional protection to the black sea bass stock in terms of reduced harvest (**Table 4.1.1.1**). Therefore, there is no difference in the biological effects on black sea bass from the alternatives.

Table 4.1.1.1. Expected closure dates for the commercial black sea bass fishery and percent of the ACL taken with a January 1 fishing year start date.

	Closure Date	% ACL
Alternative 1	No Closure	97%
Alternative 2	Aug 5 - Oct 3	100%
Alternative 3	Oct 4 - Nov 30	100%
Alternative 4	Dec 8 - Dec 31	100%
Alternative 5	Dec 1 - Dec 24	100%
Alternative 6	Dec 8 - Dec 31	100%
Sub-Alternative 7a	Aug 17 - Oct 12	100%
Sub-Alternative 7b	Dec 17 - No Closure	99-100%
Sub-Alternative 7c		
Sub-Alternative 8a		
Sub-Alternative 8b		
Sub-Alternative 9a		
Sub-Alternative 9b		
Alternative 10		

Source: SERO Analysis from October 2014.

Protected Resources

Note: The following text has been written by Council staff. Comments from the IPT will be included in the 2nd briefing book along with any materials received from NMFS Protected Resources staff.

The overall effect of **Alternatives 2** through **10** on protected resources is unknown. The South Atlantic black sea bass pot fishery is listed as a Category II fishery by the NMFS Large Whale Take Reduction Plan due to potential interactions with endangered species including fin and humpback whales (CFR 2014). Pot gears in other areas are Category I

fisheries and have been documented to cause serious injury and death to North Atlantic right whales (Johnson et al. 2005, Knowlton et al. 2012). Currently there are no published documents citing serious injury or death of large whales due to interactions with black sea bass pot gear in the South Atlantic; however, it cannot be ruled out as a fishery with interactions because determining the fishery that interacted with a whale is difficult (NMFS 2014).

The western North Atlantic right whale stock is critically endangered and at very low levels (less than 500 individuals, Waring et al. 2014). The potential biological removal for right whales is 0.9 individuals, and any mortality or serious injury is considered significant (Waring et al. 2014). Serious injury and mortality due to human anthropogenic impacts has exceeded the PBR from 2006 to 2011 (Waring et al. 2013, Waring et al. 2014). Population estimates of North Atlantic right whale increased from the 1990s to 2010s with an estimated population growth rate of 2.8% per year (Waring et al. 2014). Over this time, the minimum estimate of stock size for the North Atlantic right whale population grew from 295 (Knowlton et al. 1994) to 455 whales (Waring et al. 2014). The population trajectory is meeting two of the four criteria for down-listing (not recovery) in the revised Recovery Plan based on the growth rate exceeding 2.0% from 1990 to 2010 and less than 1% chance of quasi-extinction in 100 years (NMFS 2014). In the 2014 NMFS Biological Opinion for the American Lobster Fishery, consultation was not required unless the mortality and serious injury of right whales exceeded an annual average of 3.25 individuals over a five year period. NMFS (2014) further stated, "Given all of the available data, it is logical to conclude that commercial fishery interactions are not threatening the survival of North Atlantic right whales, particularly in light of the increasing population trend." Due to an unusually high rate of interactions 2007 to 2011 (4.25), consultation was initiated with NMFS.

Potential serious injury or mortality to right whales should be considered for management measures in the black sea bass pot fishery because right whales may be found in the South Atlantic Fishery Management Council's (SAFMC's) jurisdiction from November 1 through April 30 (NMFS 2008). The bulk of the black sea bass pot fishery effort traditionally operated from November to April. Since 2010, the black sea bass pot fishery has not opened during this time period due to ACL closures (2010 and 2011) or the regulation which closed the season for the pot fishery from November 1 through April 30 that was required by NMFS to enable an increase in the ACL without a biological opinion (since 2012) which would have delayed the ACL increase. New restrictions enacted in 2012 to reduce potential serious injury or mortality with large whales include a maximum of 35 pots per fishermen, pots must be removed from the water when the trip is completed, and an endorsement to limit the number of fishermen (32 fishermen) that could use pots to harvest black sea bass. Since these restrictions were enacted, the average number of pots in the water per day is 75 for all endorsement holders with a maximum reported number of pots fished on a day of 278; the total pots fished cannot exceeded 1,120 pots (32 fishermen times 35 pots) in the South Atlantic (SAFMC 2014).

In an effort to provide the SAFMC with means to quantify the different alternatives in Action 1, SERO conducted a risk analysis of whale observations and black sea bass pot gear location based on different management alternatives. The model assumed as a proxy that the overlap of whale observations and gear was equivalent to risk for this analysis. The Council's Scientific and Statistical Committee (SSC) agreed that the whale interaction prediction model developed by SERO provides useful spatial information on the current distribution of black sea bass pot effort and right whale distribution. The SSC considered the analysis an appropriate evaluation of potential overlap between black sea bass pot fishing and whale observations, but did not support the use of results as a proxy for whale interaction or entanglement. The SSC also did not agree with expressing differences between alternatives in terms of interaction risk, given that there is no information available to quantify current interaction risk. Instead, the SSC recommended presenting results as a dimensionless scalar value. While the analysis also provides a useful tool that could allow the Council to distinguish between alternatives, no indication of the uncertainty in the outcome for each alternative is provided, thus there is no way to determine if different outcomes are significant. Further, the ability to distinguish differences in alternatives is further reduced by omitting uncertainties in critical inputs, such as the whale distribution model. Therefore, it is unlikely that the apparent differences between alternatives are true and robust. To provide the Council with a method to qualitatively quantify the different alternatives, alternatives are grouped based on the results of the analysis.

Alternative 1 retains the closure of the black sea bass pot fishery and thus would not change the overlap between the fishery gear and right whales (lowest potential overlap)(**Table 4.1.1.2**). **Alternative 2** would prohibit black sea bass pot gear from the currently designated Right Whale Critical Habitat Area from November 15 through April 15. This reduces the current closure by 30 days in the critical habitat and would allow pot fishing off North Carolina and South Carolina until the ACL is reached. **Alternative 2** would increase the overlap of pot gear and whales off North Carolina to the highest potential level (no closed area) and increase the overlap of pot gear and whales off Florida, Georgia, and South Carolina to the second highest potential level (smallest closed area)(**Table x**).

Alternative 3 would prohibit black sea bass pot gear from the modeled calving ground from November 1 through April 30. This alternative closes areas generally less than 20 meters (m) from Cape Hatteras, North Carolina southward to the Georgia/Florida line where it gradually tapers shoreward. The timing of the closed area is greater than **Alternative 2** and closes area off North Carolina and South Carolina. However, there is still potential overlap of whales and fishery gear off Florida and Georgia and **Alternative 3** would result in the fourth highest potential overlap (**Table 4.1.1.2**).

Alternative 4 would prohibit the use of pots in depths less than 30 meters off North Carolina and South Carolina and in depths less than 25 m off Florida and Georgia. The closed area encompasses greater than 96% of the whale sightings. The closed area is

inshore from **Alternative 3** off Georgia and Florida where the highest concentration of right whale observations are located. However, the model predicts there will be little overlap between the pot fishery and right whales. **Alternative 4** has a similar potential overlap as **Alternative 6** and has the third lowest potential overlap of gear and right whales (**Table 4.1.1.2**).

Alternative 5 would prohibit the use of pots from November 1 through April 30 in a similar area to **Alternative 3** but have a smaller closed area off Florida from Daytona Beach to Cape Canaveral and a larger closed area from Georgetown, South Carolina through Cape Hatteras, North Carolina. This alternative has less potential overlap of right whales and gear compared to **Alternative 3** but more potential overlap than **Alternative 4** likely due to the smaller closed area off Florida (**Table 4.1.1.2**).

Alternative 6 would prohibit the use of pots from November 1 through April 30 in depths less than 30 m off North Carolina and South Carolina and in the gillnet restricted area off Florida and Georgia. This alternative has the second lowest potential overlap of gear and right whales but has very similar potential overlap to **Alternative 4** (**Table 4.1.1.2**).

Sub-Alternatives 7a and **7b** restrict pot use in depths less than 20 m off North Carolina and South Carolina from November 1 through December 15 and March 15 through April 30 and the currently designated Right Whale Critical Habitat Area off Georgia and Florida during differing periods. **Sub-Alternative 7a** would prohibit the use of pots in the currently designated Right Whale Critical Habitat from November 1 through December 15 and March 15 through April 30. **Sub-Alternative 7b** would prohibit the use of pots in the currently designated Right Whale Critical Habitat from November 15 through April 15. Both of these sub-alternatives have higher potential for overlap between gear and right whales than most of the other alternatives and sub-alternatives (**Table 4.1.1.2**). In particular, **Sub-Alternative 7a** does not restrict the use of pots in the currently designated Right Whale Critical Habitat from December 16 to March 14 when right whales are known to occur in the area (NMFS 2008).

Alternative 7c is similar to **Sub-Alternative 7b** for the prohibited area and timing off Florida and Georgia and has a closed area off North Carolina and South Carolina in depths less than 20 m from February 15 through April 30. This alternative likely has a higher potential overlap relative to most other alternatives and similar to **Sub-Alternatives 7a** and **7b** (**Table 4.1.1.2**).

Sub-Alternatives 8a and **8b** prohibit use of pots in depths less than 25 m off North Carolina and South Carolina over different seasons and the modelled calving grounds over different seasons. **Sub-Alternative 8a** has a longer closed pot season off the South Atlantic than **Sub-Alternative 9b** and likely has lower potential overlap between gear and right whales (**Table 4.1.1.2**). **Sub-Alternatives 8a** and **8b** likely has higher

potential overlap compared to **Alternatives 1, 4, 5,** and **6** but less than **Alternative 2** and **Sub-Alternatives 7a** and **7b** (**Table 4.1.1.2**).

Add discussion about Sub-Alternatives 9a and 9b and alternative 10 once we have results.

Although these models do provide an estimate of overlap between pot gear and right whales, there is little information on the distribution of right whales off North Carolina. Observations off North Carolina and South Carolina are more rare because the whales tend to surface less during migration and there have been fewer surveys in the area. However, right whales must migrate through the Carolinas during their migration routes north and south. Caution should be used when considering the overlap between pot gear and right whales because the serious injury or mortality of one individual is considered to be significant.

In summary, ranking the alternatives from the lowest to the highest potential overlap is as follows (**Table 4.1.1.2**): **Alternative 1** has the lowest potential overlap; **Alternatives 4**, **5**, and **6** have similar potential overlap with **Alternative 5** having slightly lower overlap off North Carolina and higher off Florida to South Carolina; **Alternative 3** has moderate potential overlap; **Alternative 2** and **Sub-Alternative 7a** and **7b** have similar potential overlap and ranked the highest of the alternatives for potential overlap.

Table 4.1.1.2. The overlap ranking of pot gear fishing location and right whale observations for Action 1 alternatives. Rank=1 indicates lowest potential overlap of the Alternatives and 12 indicates highest potential overlap of the Alternatives.

	Overlap Rank	
Alternative	Off Florida through South Carolina	Off North Carolina
Alternative 1	1	1
Alternative 2	8	8
Alternative 3	5	5
Alternative 4	3	3
Alternative 5	4	2
Alternative 6	2	4
Sub-Alternative 7a	7	6
Sub-Alternative 7b	6	7
Sub-Alternative 7c		
Sub-Alternative 8a		
Sub-Alternative 8b		
Sub-Alternative 9a		
Sub-Alternative 9b		
Alternative 10		

4.1.2 Economic Effects

Several factors impact the potential economic effects for each of the alternatives for **Action 1**. The following are taken into account as part of this analysis:

- The variations in price per pound for black sea bass from month to month over different time series
- The daily fishing rate expected for black sea bass for the alternatives
- The date the commercial ACL for black sea bass is expected to be reached, if at all
- Trip costs associated with black sea bass pot trips
- Other fishing activity black sea bass pot vessels traditionally participated in if not fishing black sea bass pots

The commercial black sea bass fishery has undergone many changes in management in recent years. The history of management in **Appendix D** lists regulation changes for the snapper grouper complex. **Table 4.1.2.1** summarizes management actions directly affecting the black sea bass pot fishery.

Table 4.1.2.1. History of SAFMC management of the commercial black sea bass pot fishery.

Date	Document	Action
8/31/83	Original FMP	8" size limit
1/1/92	Amendment 1	Prohibit black sea bass pots south of Cape Canaveral
8/31/92	Emergency Rule	Modified definition of black sea bass pots Allowed multigear trips for black sea bass Retention of bycatch in the black sea bass fishery
2/24/99	Amendment 9	10" total length size limit Require escape vents and degradable fasteners
12/2/99	Amendment 11	Set overfished level at 3.72 mp
10/23/06	Amendment 13c	Commercial step-down in ACL from 477,000 lbs gw in 2006 to 309,000 lbs gw in 2008 Require 2" mesh on pots Change fishing year to June through May
7/1/12	Amendment 18a	Reduced participation to 32 endorsements 1,000 lbs gw (1,180 ww) commercial trip limit Maximum of 35 pots per vessel Increased size limit to 11" total length Pots must be brought to shore at the conclusion of a trip
9/23/13 10/23/13	Reg Amend 19 Reg Amend 19	Increase commercial ACL from 309,000 to 780,020 lbs ww Pot closure from 11/1 through 4/30
12/8/14	Reg Amend 14	Commercial fishing year changed to January - December Hook and line trip limit is 300 lbs gw November 1 - April 30

Snapper Grouper Amendment 13C (SAFMC 2006) greatly stepped down the commercial ACL for black sea bass, the majority of which was historically taken in the pot fishery (but not in the 2014 season). Two additional amendments, 18A (SAFMC 2012x) and Regulatory Amendment 19 (SAFMC 2013x) further affected commercial fishing for black sea bass, but in very different ways.

Amendment 18A implemented endorsements to participate in the pot fishery. Thirty-two endorsements were issued. For the first time, there was a commercial trip limit of 1,000 lbs gw (1,180 lbs ww) for the pot fishery. Participants in the fishery were limited to no more than 35 pots per vessel, whereas prior to the implementation of Amendment 18A some were fishing as many as 150 pots. Leaving black sea bass pots to soak unattended was prohibited, as pots were required to be brought back at the end of each trip. The size limit for commercial black sea bass was also increased from 10 to 11 inches total length.

While Amendment 18A generally limited participation and reduced gear presence in the water, Regulatory Amendment 19 increased the commercial ACL from 309,000 gw to 780,020 lbs ww. Because of the limitations put into place in Amendment 18A and the significant increase in the ACL, the commercial harvest of black sea bass using pots is expected to last much longer than it has in recent years.

All of these changes taken together create a management scenario that makes it difficult to predict how fishery participants will modify their behavior, and in turn, the economic effects in response to the alternatives proposed in this action. Because of the uncertainty, multiple scenarios must be considered where appropriate when estimating economic effects of potential management changes.

Price per pound by month

There are many ways of analyzing prices, but for the present analysis, monthly price per pound is generated by taking averages over a period of years. Two periods, fishing years 2000/2001 through 2012/2013 and fishing years 2010/2011 through 2012/2013, are chosen for the present analysis. These two series were chosen because the first typifies a long time series and the second because it reflects the most recent fishing years. However, in this analysis because of so many management changes affecting this fishery in recent years (**Table 4.1.2.1**), any choice of years for analyzing prices has advantages and drawbacks. Using 2000/2001 through 2012/2013 is good for showing what has occurred on average over the long period, but is confounded by more management measures. Using 2010/2011 through 2012/2013 does show most recent trends, but prices for the months of June through October may be depressed due to a glut in the market caused by a derby in the pot component in the fishery and artificially inflate the value of fish caught in the winter months when few black sea bass were available. Additional analyses, such as calculating price values for the seasons of 2006/2007 through 2008/2009 might be of value as these were the last full seasons when there were not routine closures due to the commercial sector reaching is its ACL. (The 2008/2009

season did close two weeks prior to the end of the fishing year, however, it operated normally up until that closure.)

Figure 4.1.2.1 below shows the average price per pound (gw) by month for fish caught from 2000 through 2013 and for 2011 through 2013. From 2000 through 2013, average monthly price per pound varied about $0.40 from lowest month to highest month. The average price ranged from a low of $2.26 (2013 dollars) in June to a high of $2.62 (2013 dollars) in August and September. The average annual price per pound paid at time of landing was $2.44 (in 2013 dollars) for these same fishing seasons.

From 2011 through 2013 price per pound averaged $3.96 and $4.13 (in 2013 dollars) in November and December. The lowest price per pound values were in June, July, August, September, October, and January, averaging $2.06, $2.55, $2.96, $2.92, $2.83, and $2.88 (in 2013 dollars), respectively. The average annual price per pound paid at time of landing was $2.57 (in 2013 dollars) for these same fishing seasons. Note that the commercial fishing season for black sea bass closed early on 10/7/2010, 7/15/11, and 10/08/2012 for the three fishing years used in the analysis. Prices for months after the closure were based on relatively low landings which could affect the level of prices. The analysis assumes value will remain constant even if landings increase in months where there was little data to estimate price per pound.

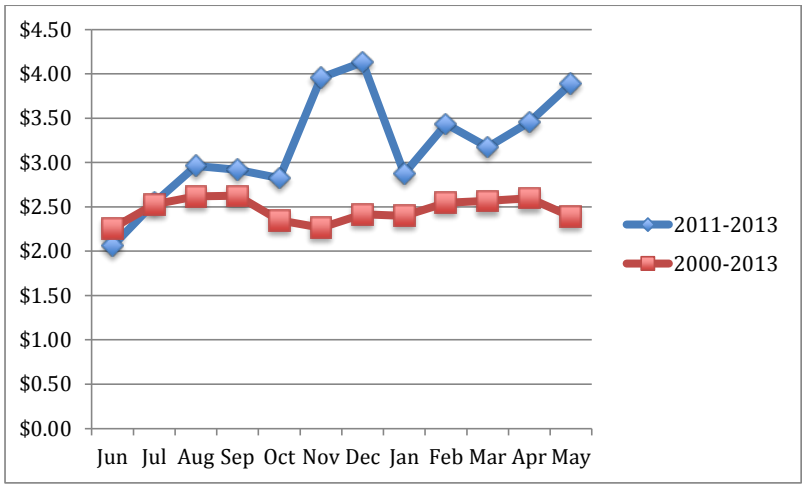

Figure 4.1.2.1. Average price per pound (gw) in the South Atlantic region for black sea bass by month for 2000 – 2013 and 2011 – 2013 (in 2013 dollars).
Source: SEFSC Commercial ACL Dataset, ACL_Tables_07102914

Since 2011 price per pound for black sea bass changed due to product availability on the market as well as condition of the fish. With the rebuilding of the black sea bass stock, larger fish are now landed that were not available in previous years (Personal Comm. Jack Cox, January 16, 2015). The price of black sea bass in the South Atlantic region is

also affected by the availability of black sea bass from the Mid-Atlantic region trawl fishery. When both fisheries are open, prices tend to be lower. Market quality of the fish is higher in winter months since the fish sold tend to be larger and darker in color, both of which lead to a higher price per pound.

The alternatives proposed under **Action 1** result in different expected dates when the commercial ACL would be reached. However, the months the fishery is open will not affect the price fishermen receive if future price per pound trends mirror the longer, 2001-2013 trend. Alternatives that would allow the pot fishery to remain open in November, December, February, April, and May would be expected to result in the greatest return for black sea bass pot fishermen if future price per pound trends mirror the shorter, 2011-2013 trend. In the future, it is probable that the price per pound trend from month to month will be somewhere between the two ranges presented here.

Daily fishing rate

The alternatives for **Action 1** specify various closure conditions for January through April and for November and December. Because the size and areas closed vary during these months from alternative to alternative, the expected daily rate for landing black sea bass also varies. The analyses here use the daily fishing rates provided by SERO (2014). In calculating the expected daily fishing rates, the SERO (2014) report based calculations on multiple scenarios of two factors: predicted pot placement locations (Scenarios A, B, and C) and catch rate estimates (Scenarios 1, 2, 3, and 4). The analyses in this section analyze all four catch rate scenarios, but only analyzed pot placement Scenario C (pot locations based on the last three seasons 2006/2007 through 2008/2009). Scenarios A (based on the spatial distribution of trap gear endorsement holder landings under simulated Amendment 18A regulations for the Nov-May period of the 2008/09 season) and B (based on the spatial distribution of trap gear endorsement holder landings during the June-Oct period of the 2013/14 season) were not considered at this time because Scenario C was the scenario considered the trap placement for the entire calendar year in the last three seasons when black sea bass pots were able to fish all year long.

Expected closure date

Table 4.1.2.2 shows expected closure dates for **Alternatives/Sub-alternatives 1** through **10**. The expected closure dates shown assume that mean conditions exist and are shown only for pot placement Scenario C (placement for 2006/2007 through 2008/2009 seasons) and for each of the four catch rate scenarios.

Table 4.1.2.2. Expected closure dates for each alternative/sub-alternative of Action 1 using Scenario C (last three complete year around seasons prior to current management for mean conditions) for each of the four catch rate scenarios (Scenarios 1-4).

Scenario C	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Alternative 1	No Closure	No Closure	No Closure	No Closure
Alternative 2	10/2	8/4	9/20	9/27
Alternative 3	11/26	10/4	10/26	11/19
Alternative 4	12/20	12/7	12/11	12/19
Alternative 5	12/16	12/1	12/6	12/15
Alternative 6	12/20	12/7	12/10	12/19
Sub-Alternative 7a	10/11	8/18	10/6	10/7
Sub-Alternative 7b	No Closure	12/27	12/19	No Closure
Sub-Alternative 7c	12/27	12/16	12/13	12/28
Sub-Alternative 8a	12/6	10/17	10/29	12/5
Sub-Alternative 8b	No Closure	12/28	12/20	No Closure
Sub-Alternative 9a	10/28	9/15	10/13	10/24
Sub-Alternative 9b	12/31	12/24	12/17	No Closure
Alternative 10	No Closure	12/25	12/18	No Closure

Because the commercial black sea bass fishing year was changed to start January 1 through the implementation of Snapper Grouper Regulatory Amendment 14 (SAFMC 2014), alternatives that would project the entire ACL to be available to the black sea bass pot fishery for the entire calendar year would be expected to have the highest positive economic effect.

The commercial black sea bass sector was closed prior to the end of the fishing year in 2008/2009 when the commercial ACL was met. Commercial harvest of black sea bass was closed on May 15, 2009. Prior to that season, the fishery operated without closures. **Figure 4.1.2.2** shows the average percent of total annual commercial black sea bass landings by month from June 2000 through May 2009, the most recent seasons prior to years when there were ACL-related closures. When operating without closures, the months of June through September saw the fewest commercial landings of black sea bass, ranging from 2-4% each month, while landings tended to increase in November with an average of 11% of the landings. However, fall through spring months saw the highest percentage of annual landings. Highest average annual percentage of total landings occurred in December at 19% and in January at 18%.

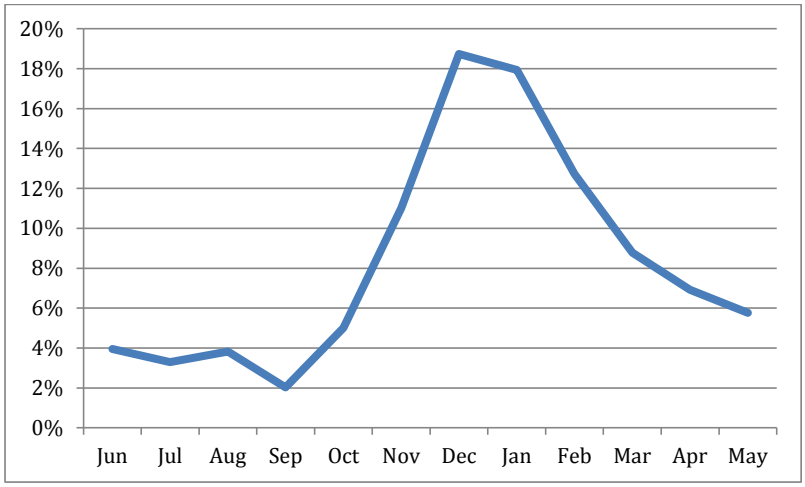

Figure 4.1.2.2 Percent of average annual commercial black sea bass landings by month from June 2000 through May 2009.
Source: SEFSC Logbook Data

Expected dockside revenue of the commercial black sea bass fishery

This analysis of the expected value of the alternatives and applied scenarios assumes that demand for black sea bass will at least remain constant regardless of when the fish will be landed. At the very least, demand for black sea bass is assumed to be at the same level as in those years when no closures were in effect.

Expected closure date alone does not give the best estimate of expected value because the price per pound changes from month to month. The highest expected economic value will come when the expected landings are highest in months with the highest price per pound. Various estimates of average monthly price per pound, daily expected catch rates, and anticipated closure dates were used to calculate estimated annual dockside values for black sea bass. Estimates are shown for the four catch rate scenarios used in the SERO (2014) analysis and are based on the assumption that spatial location of gear in future years will mirror the average of the 2006/2007 through 2008/2009 fishing seasons where there was no closure in the commercial black sea bass season. **Table 4.1.2.3** shows the expected dockside values.

Table 4.1.2.3. Expected dockside value of commercial black sea bass under the alternatives of Action 1 using two price per pound estimates, the four different catch rate scenarios (SERO 2014), and estimations of spatial locations of gear based on the 2006/2007 through 2008/2009 fishing seasons (Scenario C; SERO 2014).

	Price/lb years	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Alternative 1	2000-2013	$1,569,123	$1,569,123	$1,569,123	$1,569,123
	2011-2013	$1,887,971	$1,887,971	$1,887,971	$1,887,971
Alternative 2	2000-2013	$1,635,233	$1,618,721	$1,639,565	$1,644,952
	2011-2013	$1,945,365	$1,936,277	$1,945,624	$1,918,559
Alternative 3	2000-2013	$1,627,184	$1,636,790	$1,631,444	$1,627,930
	2011-2013	$1,901,609	$1,912,821	$1,918,138	$1,895,652
Alternative 4	2000-2013	$1,620,180	$1,621,455	$1,623,395	$1,619,423
	2011-2013	$1,941,208	$1,916,327	$1,943,233	$1,938,245
Alternative 5	2000-2013	$1,621,240	$1,625,121	$1,622,455	$1,612,037
	2011-2013	$1,933,117	$1,904,803	$1,929,912	$1,918,463
Alternative 6	2000-2013	$1,620,934	$1,622,535	$1,617,945	$1,620,283
	2011-2013	$1,942,206	$1,917,652	$1,933,480	$1,951,499
Sub-Alternative 7a	2000-2013	$1,633,016	$1,623,399	$1,636,256	$1,637,312
	2011-2013	$1,898,353	$1,931,969	$1,929,920	$1,905,005
Sub-Alternative 7b	2000-2013	$1,612,980	$1,618,994	$1,619,331	$1,609,540
	2011-2013	$1,953,797	$1,956,812	$1,953,024	$1,947,064
Sub-Alternative 7c	2000-2013	$1,618,203	$1,615,920	$1,615,784	$1,616,142
	2011-2013	$1,966,755	$1,958,723	$1,951,712	$1,962,483
Sub-Alternative 8a	2000-2013	$1,622,132	$1,631,986	$1,631,998	$1,627,641
	2011-2013	$1,908,323	$1,902,456	$1,919,048	$1,911,242
Sub-Alternative 8b	2000-2013	$1,611,962	$1,622,657	$1,628,335	$1,607,346
	2011-2013	$1,954,835	$1,968,018	$1,971,977	$1,946,311
Sub-Alternative 9a	2000-2013	$1,630,090	$1,635,086	$1,636,224	$1,631,169
	2011-2013	$1,889,515	$1,923,914	$1,929,137	$1,891,417
Sub-Alternative 9b	2000-2013	$1,617,278	$1,619,225	$1,621,199	$1,618,966
	2011-2013	$1,863,517	$1,960,196	$1,956,662	$1,964,635
Alternative 10	2000-2013	$1,619,643	$1,560,437	$1,624,093	$1,614,361
	2011-2013	$1,968,247	$1,862,060	$1,964,981	$1,958,558

Figure 4.1.2.3 and **Figure 4.1.2.4** graphically show the expected economic value for each of the alternatives under Scenarios 1 – 4 and using each of the price per pound calculation methods.

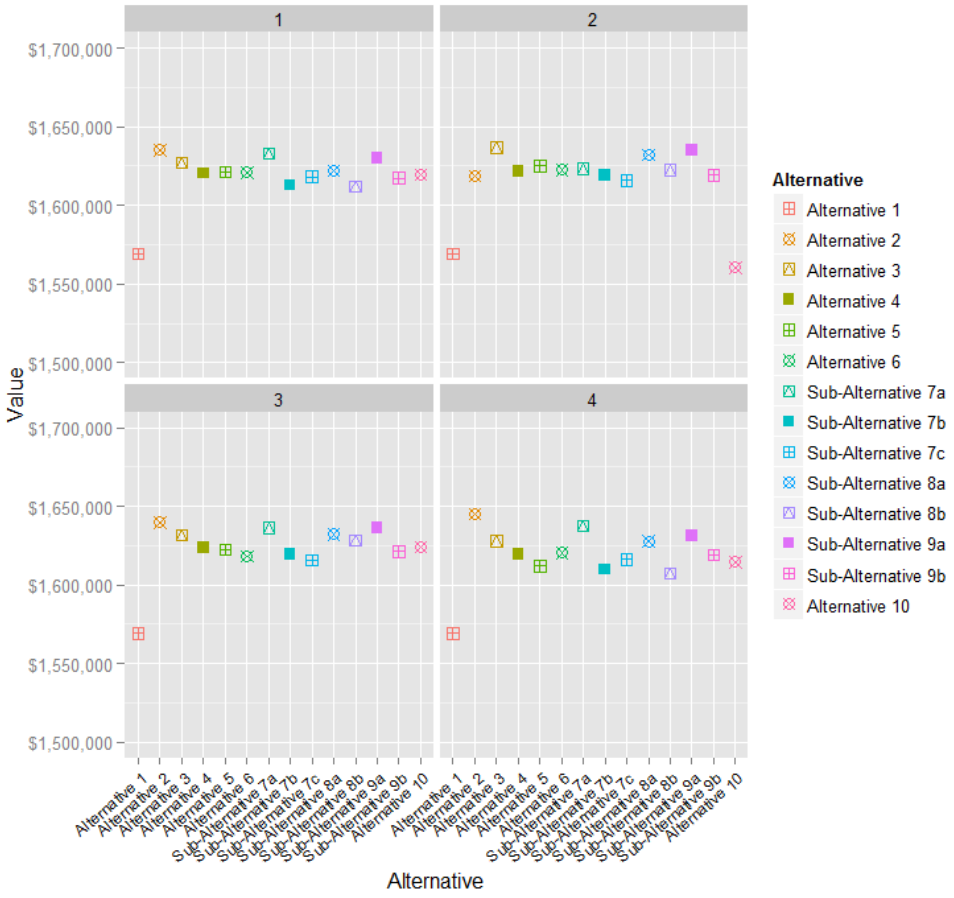

Figure 4.1.2.3. Graphic representation of economic value of Alternatives 1-10 and Scenarios 1-4 using 2000-2013 monthly average price per pound (in 2013 dollars).

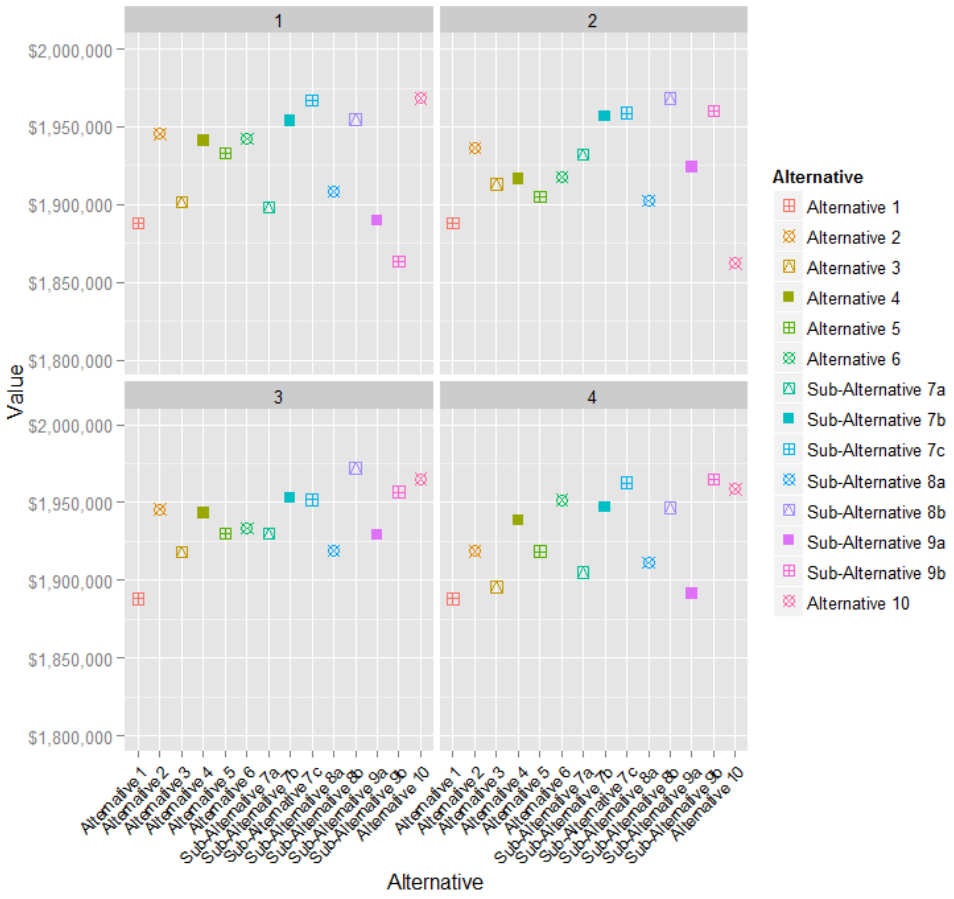

Figure 4.1.2.4. Graphic representation of economic value of Alternatives 1-10 and Scenarios 1-4 using 2011-2013 monthly average price per pound (in 2013 dollars).

When 2000-2013 price per pound estimates are used, **Alternatives 2** (Scenarios 1, 3, and 4) and **3** (Scenario 2) produced 4-5% higher expected economic returns compared to **Alternatives 1 (No Action)** (Scenarios 2-4) and **10** (Scenario 1). When 2011-2013 price per pound estimates are used, **Alternatives 2 – 3** and **Sub-alternative 8b** produced 5-6% higher expected economic returns compared to **Alternatives 1 (No Action)** (Scenarios 3-4), **9b** (Scenario 1) and **10** (Scenario 2).

As shown in **Table 4.1.2.4**, regardless of which price per pound value time series, **Alternative 10** (Scenario 2) had the lowest expected price per pound when compared to **Alternative 2** through **Alternative 10**. The alternatives with the highest expected economic values are not the same for each of the price per pound calculations as the pattern of months with the highest and lowest values are not the same across both time periods. Using the average monthly price per

pound for the years 2000 – 2013, **Alternative 2** (scenario 4 – landings rate equivalent to the mean rate by month for the 2006/2007 – 2008/2009 seasons) estimates the highest expected economic value. Using the average monthly price per pound for the years 2011 – 2013, **Sub-alternative 8b** (Scenario 3 – landings rate equivalent to catch rate from Oct 2013) estimates the highest expected economic value.

Table 4.1.2.4. Maximum and minimum expected economic values of Alternatives 1 – 10 using the 2000-2013 and 2011-2013 prices per pound (gw) for black sea bass (all gears) in 2013 dollars.

	2000-2013	2011-2013
Maximum	$1,644,952 Alternative 2	$1,971,977 Sub-Alternative 8b
Minimum	$1,560,437 Alternative 10	$1,862,060 Alternative 10
Difference	$84,515	$109,917
% Difference	5%	6%

Trip costs

The net profitability of a fishing trip is determined by subtracting individual trip costs (fuel, bait, gear, crew payments, etc.) and apportioning sunk costs (insurance, loan payments, license/permits, etc.). Sunk costs will occur regardless of the trip characteristics and are constant. Individual trip characteristics affect individual trip costs. For example, the distance a vessel must travel will influence fuel needed for the trip.

Perruso and Waters (2005) estimated trip-level cost for trap vessels based on effort (number of traps), days away (trip duration), and pounds landed. Crew expenses are excluded from the model because crewmembers are assumed to be compensated through a share payment system. Based on this model, and using average trip characteristics for black sea bass endorsement holders, the estimated cost of a trip is $541.24 (2013 dollars). Net revenue (dockside value minus trip costs) analysis could be conducted in the future.

Fewer trips are needed to land the commercial ACL when landings per trip increase. **Table 4.1.2.5** shows average landings per trip by year and month for all participants in the black sea bass pot fishery. However, current landings per trip are constrained by the trip limit of 1,000 lbs gw that went into effect July 1, 2012 (SAFMC 2012). Net profit for a trip will increase when the landings per trip are higher assuming trip costs remain relatively the same regardless of when a black sea bass pot trip occurs up until the trip limit is reached. The months of November through March have the potential for greater profitability per trip because of the higher average landings per trip in these months. The months of April through October had the lowest average landings per trip.

Table 4.1.2.5. Average landings of black sea bass per trip using pot gear by year and month for 2001 – 2013 (lbs gw). 2012 and 2013 landings are for endorsement holders only.

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Average
January	735	584	531	893	955	636	625	648	758					707
February	592	470	529	757	770	597	635	651	657					629
March	412	418	499	653	658	450	566	588	593					538
April	368	269	427	626	581	416	412	334	331					418
May	315	298	357	436	491	301	344	566	Conf.					389
June	365	244	375	395	264	333	340	536	612	739	1229		648	507
July	344	227	382	406	266	361	Conf.	402	641	670	971	663	634	497
August	257	242	552	653	283	364	216	621	735	840		685	629	506
September	223	243	395	452	Conf.	239	Conf.	309	645	896		595	590	459
October	243	362	481	509	339	434	262	502	618	1005		715	609	507
November	383	453	668	591	475	653	446	786	689					571
December	441	676	1036	760	505	735	576	877	720	1255				758

Source: SEFSC Logbook data.

Other fishing opportunity

Alternative 1 (No Action) provides a 6-month window in which all black sea bass pot fishing must occur. Even with no restrictions on where pots may be set from May 1 through October 31, the commercial sector is not expected to be able to reach its ACL each year (SERO 2014). In years past when the black sea bass commercial sector fishery was open all year, fishermen tended to take fewer trips in summer months (**Table 4.1.2.6**). In years where there were closures due to the ACL being reached, a summer derby took place. The commercial portion of the ACL was caught earlier each year as the black sea bass stock recovered and the ACL remained steady. The months of November through April had the highest average number of trips in years when fishing occurred in those months. The months of May through October had the lowest average number of trips.

Table 4.1.2.6. Average number of trips landing black sea bass using pot gear by year and month for 2001 – 2013. 2012 and 2013 landings are for endorsement holders only.

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Average
January	112	199	85	104	90	111	81	115	101					111
February	72	92	54	95	66	89	110	76	99					84
March	86	63	55	100	40	59	100	43	59					67
April	115	54	50	68	63	57	52	46	48					61
May	83	34	88	62	67	71	23	21	Conf.					56
June	53	34	28	37	57	54	24	13	49	112	163		92	60
July	27	40	39	32	22	26	Conf.	23	41	68	58	110	78	47
August	67	24	63	17	13	38	12	20	55	68		124	59	47
September	56	31	26	19	Conf.	33	Conf.	10	74	54		57	62	42
October	98	29	57	67	18	63	21	31	65	12		25	61	46
November	127	64	83	92	53	74	54	57	72					75
December	187	119	130	117	88	102	96	66	63	77				105

Source: SEFSC Logbook data.

Assuming the commercial black sea bass fishery would remain open all year, or nearly all year, the fishery is currently less likely to operate as a derby. Instead of feeling forced to fish for black sea bass during a time of the year when there is a derby, black sea bass pot fishermen might choose to participate in other fisheries that might have a higher net return.

Table 4.1.2.7 shows the average monthly value for black sea bass and total value of landings (in 2013 dollars) from all federally managed species by black sea bass endorsement holders from 2000 through 2013. The data are grouped into two categories, one showing 2000 through 2009 when the fishery was a year around fishery and from 2010 through 2013 when the fishery was constrained by the ACL and was closed for at least part of the year. From 2000 through 2009, an average of 28.6 endorsement holders fished each year. Average black sea bass value per endorsement from 2000 through 2009 was $25,958 per endorsement and total average annual value from all federally managed species was $47,104. From 2010 through 2013 an average of 26.75 endorsement holders fished each year. Average black sea bass value per endorsement from 2010 through 2013 was $23,399 per endorsement and total average annual value from all federally managed species from all trips (not just black sea bass pot trips) was $53,280. These values do not include landings for those fisheries not included on federal logbooks such as state managed fisheries.

Table 4.1.2.7. Value (in 2013 dollars) black sea bass and total value of federal landings by month by black sea bass pot endorsement holders, 2000 – 2013.

	2000 - 2009		% Rev	2010 - 2013		% Rev
	BSB Revenue	Total Revenue	from BSB	BSB Revenue	Total Revenue	from BSB
January	$144,312	$176,279	82%	$0	$87,510	0%
February	$104,550	$134,354	76%	$0	$52,838	0%
March	$76,271	$130,874	58%	$0	$36,094	0%
April	$56,530	$98,924	57%	$0	$34,417	0%
May	$39,442	$105,963	37%	$888	$103,130	1%
June	$27,617	$98,862	28%	$169,497	$223,667	76%
July	$22,588	$79,336	28%	$144,861	$265,855	54%
August	$29,740	$84,068	35%	$123,302	$199,221	62%
September	$21,031	$63,657	33%	$81,475	$161,669	50%
October	$39,789	$98,367	40%	$48,027	$93,752	51%
November	$39,789	$98,367	40%	$995	$51,195	2%
December	$140,732	$178,132	79%	$56,874	$115,902	49%
Annual	$742,391	$1,347,182	55%	$625,919	$1,425,251	44%

Source: SEFSC Logbook Data.

Prior to 2010, the black sea bass pot fishery occurred all year long. As ACLs went into effect, a derby developed and the fishery lasted for as little as two months. The lowest monthly black sea bass revenues for 2000 through 2009 occurred in the months of June through August. Once the ACLs started shortening the season, the majority of black sea bass fishing shifted to June through September. However, given the increased ACL implemented in Regulatory Amendment 19 (SAFMC 2013c), the fishing season is expected to last much longer regardless of which

alternative is chosen as the preferred alternative for **Action 1** compared to the years 2010 through 2013.

Table 4.1.2.8 indicates the shift in landings and dockside revenue (in 2013 dollars) from those landings in the South Atlantic. 2012 and 2013 are the two seasons in which an endorsement was required to land black sea bass using pot gear. The ACL increased to 780,000 lbs ww in 2013. From 2012 to 2013, black sea bass pot endorsement holders increased their landings by just over 2,000 lbs ww. However, all other gears (primarily hook and line) landings of black sea bass increased by over 65,000 lbs ww, an increase of over 50% of the previous year's landings by other gears.

Table 4.1.2.8. Pounds landed and revenue (in 2013 dollars) of black sea bass landed from 2000 through 2013 by endorsement holders (pots only landings), all landings by pots (including endorsement holders), and all other gears (not black sea bass pots).

	Endorsement Holders		All Pot Fishermen		All Other Gears	
	Pounds	Revenue	Pounds	Revenue	Pounds	Revenue
2000	204,436	$538,858	402,475	$1,077,881	67,652	$184,532
2001	249,915	$596,232	442,115	$1,073,488	69,902	$169,700
2002	242,962	$542,892	361,034	$804,127	64,168	$149,288
2003	294,477	$676,505	441,871	$1,018,357	64,444	$149,105
2004	388,906	$858,743	524,262	$1,168,114	74,942	$165,333
2005	291,896	$719,028	333,153	$818,833	57,057	$140,779
2006	363,667	$1,018,508	395,025	$1,108,578	51,431	$142,683
2007	261,299	$791,825	307,182	$924,528	40,404	$119,743
2008	277,394	$790,753	326,514	$924,070	45,346	$127,522
2009	386,543	$1,025,710	473,896	$1,259,066	64,636	$171,413
2010	304,176	$789,048	342,530	$892,347	49,156	$130,358
2011	180,508	$412,161	256,589	$549,130	46,204	$96,760
2012	206,678	$598,888	211,773	$612,118	90,964	$267,628
2013	208,862	$613,044	220,915	$644,546	156,700	$463,714

Source: SEFSC Logbook Data.

If the commercial black sea bass ACL could continue to be made to last year around as occurred in 2014, there probably will not be a derby in the future. Fishermen may go back to participating in fisheries similar to what they did prior to the ACL closures. Assuming the entire black sea bass ACL would be landed each year, black sea bass pot endorsement holders might be more likely to increase participation in other fisheries, primarily in the months of June through August. **Table 4.1.2.9** shows the predominant other federally managed fisheries (non-black sea bass fisheries) black sea bass pot endorsement holders participated in by month for the years 2000 through 2009 and 2010 through 2013.

Table 4.1.2.9. Predominant non-black sea bass federally managed fisheries participation by month for 2000-2009 and 2010-2013 by black sea bass pot endorsement holders.

	2000 - 2009	2010 - 2013
January	king mackerel	vermilion, triggerfish, king mack, tilefish
February	king mackerel	vermilion, triggerfish, king mack, tilefish
March	king mackerel	vermilion, triggerfish, king mackerel
April	king mack, gag, triggerfish, vermilion	king mackerel
May	shallow water groupers, king mack	shallow water groupers, king mack
June	shallow water groupers, vermilion	shallow water groupers, grunts, porgies
July	shallow water groupers, vermilion	jacks, vermilion, shallow water groupers
August	shallow water groupers, vermilion	jacks, vermilion, shallow water groupers
September	shallow water groupers, vermilion	jacks, vermilion, shallow water groupers
October	shallow water groupers, vermilion	jacks, grunts, shallow water groupers
November	shallow water groupers, vermilion	grunts, jacks, king mackerel
December	shallow water groupers, king mack	king mackerel

Source: SEFSC Logbook Data.

Summary comparison of economic effects

Table 4.1.2.10 is a summary of economic effects from **Alternatives 1** through **10** for **Action 1**. The table shows the rank order from lowest to highest expected economic return for each alternative based on the data shown in **Table 4.1.2.3**. The expected closure date of the commercial black sea bass fishery (SERO 2014) for the alternative expected to produce the greatest positive economic effect for each of the four catch rate scenarios and the two price per pound calculation methods is shown. The order of expected least to most economic value is based on the two time periods for calculating average monthly prices (either 2000-2013 or 2011-2013) described above and the four landings rate scenarios (SERO 2014). The insertion of these factors into the analysis adds enough variability to the results indicating that there is no clear "best choice" alternative. However, **Alternatives 2** through **Alternative 10** had a higher expected rate of economic return than **Alternative 1 (No Action)**, except for **Alternative 10** (Scenario 2) where the expected economic value was expected to be less than **Alternative 1 (No Action)**.

Table 4.1.2.10. Ranking of alternatives for Action 1 from least to most expected positive economic effects for two price per pound calculation methods and four catch rate scenarios with expected closure date for the alternative with the greatest positive expected economic value.

	Scenario 1		Scenario 2		Scenario 3		Scenario 4	
	2000-2013	2011-2013	2000-2013	2011-2013	2000-2013	2011-2013	2000-2013	2011-2013
Least +	Alt. 1	Sub-Alt. 9b	Alt. 10	Alt. 10	Alt. 1	Alt. 1	Alt. 1	Alt. 1
	Sub-Alt. 8b	Alt. 1	Alt. 1	Alt. 1	Sub-Alt. 7c	Alt. 3	Sub-Alt. 8b	Sub-Alt. 9a
	Sub-Alt. 7b	Sub-Alt. 9a	Sub-Alt. 7c	Sub-Alt. 8a	Alt. 6	Sub-Alt. 8a	Sub-Alt. 7b	Alt. 3
	Sub-Alt. 9b	Sub-Alt. 7a	Alt. 2	Alt. 5	Sub-Alt. 7b	Sub-Alt. 9a	Alt. 5	Sub-Alt. 7a
	Sub-Alt. 7c	Alt. 3	Sub-Alt. 7b	Alt. 3	Sub-Alt. 9b	Alt. 5	Alt. 10	Sub-Alt. 8a
	Alt. 10	Sub-Alt. 8a	Sub-Alt. 9b	Alt. 4	Alt. 5	Sub-Alt. 7a	Sub-Alt. 7c	Alt. 5
	Alt. 4	Alt. 5	Alt. 4	Alt. 6	Alt. 4	Alt. 6	Sub-Alt. 9b	Alt. 2
	Alt. 6	Alt. 4	Alt. 6	Sub-Alt. 9a	Alt. 10	Alt. 4	Alt. 4	Alt. 4
	Alt. 5	Alt. 6	Sub-Alt. 8b	Sub-Alt. 7a	Sub-Alt. 8b	Alt. 2	Alt. 6	Sub-Alt. 8b
	Sub-Alt. 8a	Alt. 2	Sub-Alt. 7a	Alt. 2	Alt. 3	Sub-Alt. 7c	Sub-Alt. 8a	Sub-Alt. 7b
	Alt. 3	Sub-Alt. 7b	Alt. 5	Sub-Alt. 7b	Sub-Alt. 8a	Sub-Alt. 7b	Alt. 3	Alt. 6
	Sub-Alt. 9a	Sub-Alt. 8b	Sub-Alt. 8a	Sub-Alt. 7c	Sub-Alt. 9a	Sub-Alt. 9b	Sub-Alt. 9a	Alt. 10
	Sub-Alt. 7a	Sub-Alt. 7c	Sub-Alt. 9a	Sub-Alt. 9b	Sub-Alt. 7a	Alt. 10	Sub-Alt. 7a	Sub-Alt. 7c
Most +	Alt. 2	Alt. 10	Alt. 3	Sub-Alt. 8b	Alt. 2	Sub-Alt. 8b	Alt. 2	Sub-Alt. 9b
Closure date	3-Oct	No Closure	4-Oct	28-Dec	6-Oct	20-Dec	27-Sep	No Closure

4.1.3 Social Effects

The social effects of removal or modifications to the seasonal closure for black sea bass pots include direct effects on participants in the black sea bass pot fishery, and direct effects on participants in the hook-and-line (and other gear types) portion of the black sea bass fishery. For pot fishermen, the potential effects are primarily associated with foregone economic benefits due to restricted or no access to the black sea bass resource during the winter. For hook-and-line fishermen, the potential effects of removal or modifications to the seasonal closure for black sea bass pots are associated with greater competition with pot fishermen, less access to the increased black sea bass ACL, and a likely shorter fishing season because the ACL would be more available to the pot fishermen, who make up most of the landings. Minimal indirect effects are expected for recreational anglers and for-hire businesses.

Sections 3.3.3 and **3.3.4** provide detailed information about the social environment for the black sea bass fishery. **Figure 3.3.3.2** shows communities with the highest pounds of black sea bass harvested by pots, with the top ten including Sneads Ferry (North Carolina), Georgetown (South Carolina), Little River (South Carolina), Harkers Island (North Carolina), McClellanville (South Carolina), Ponce Inlet (Florida), Hampstead (North Carolina), Cape Carteret (North Carolina), Wrightsville Beach (North Carolina), and Topsail Beach (North Carolina). **Figure 3.3.3.3** shows communities with the highest pounds of black sea bass harvested by bandit gear, with the top three including Little River (South Carolina), Southport (North Carolina), and Topsail Beach (North Carolina). Additionally, considering engagement and reliance on commercial fishing for each community (**Figure 3.3.3.4**) and social vulnerability (**Figure 3.3.4.1**), the communities of Wanchese (North Carolina) and Sneads Ferry (North Carolina) are those that would be expected to experience positive and negative effects of changes for the black sea bass pot fishermen.

Black sea bass pot fishermen have been affected by multiple management changes in a relatively short period of time through recent Council actions and Atlantic Large Whale Take Reduction Plan (ALWTRP) requirements. Following the restrictive catch limits implemented in the rebuilding plan, and an effort shift from other target species due to ACLs and AMs, pot fishermen have experienced increasingly shorter seasons and continual overages. When the endorsement program was implemented through Amendment 18A (SAFMC 2012a), more than half of active pot fishermen did not receive an endorsement and could no longer participate in the pot fishery. Although the landings level of active fishermen who did not qualify for an endorsement was relatively small (to qualify for a black sea bass endorsement, a fishermen with a valid snapper grouper commercial must have had black sea bass landings using black sea bass pot gear averaging at least 2,500 pounds whole weight, annually during the period January 1, 1999 through December 31, 2010), the endorsement program also created an additional barrier for future participants. Overall, the endorsement program permanently locked out most fishermen from this portion of the black sea bass fishery.

Fishermen, who did receive endorsements, were placed under a new trip limit, the new pot limit, and requirement to bring pots to shore at the end of each trip. When the final rule for Regulatory Amendment 19 (SAFMC 2013c) indicated that the ACL could be more than doubled, there were only partial positive effects for the pot fishermen due to the closure from November through April that has restricted them from benefitting from the extended season and larger ACL. [While the closure was intended to minimize interaction of pot gear with large whales, it was also included in Regulatory Amendment 19 in order to expedite the increase in the black sea bass ACL due to the additional time that would have been required for NMFS to complete a Section 7 consultation for the snapper grouper fishery (SAFMC 2013c)] Additionally, black sea bass pot fishermen are required to comply with the ALWTRP gear and seasonal requirements (**Table 1.6.1**), which have been in place for the black sea bass pot fishery since 2007, with the most recently added requirements implemented in November 1, 2014.

Under **Alternative 1 (No Action)**, pot fishermen would continue to forego economic benefits that would be available if harvest by pot was allowed into the winter months. Some fishermen report that black sea bass caught in the winter are larger and more abundant, and market prices are better. However, some pot fishermen from the Carolinas have voiced concern that the winter pot fishery for black sea bass would favor Florida fishermen. Weather in Florida is generally better than weather conditions in North Carolina and South Carolina, and Florida pot fishermen could catch a greater proportion of the commercial ACL in winter months. Public input also indicates that some pot fishermen feel that compliance with the ALWTRP requirements, in addition to the measures established with the endorsement program are sufficient to protect right whales and calves, and keeping the seasonal closure invalidates the rationale and purpose for all protection measures under the ALWTRP and through Amendment 18A.

For black sea bass participants who do not have a black sea bass pot endorsement, **Alternative 1 (No Action)** would be expected to provide the most benefits. The seasonal pot closure allows fishermen without a black sea bass pot endorsement to use gear types other than black sea bass pots to fish for black sea bass in the winter months. If pots are used during the winter months, it is more likely that the commercial ACL for black sea bass would be met before

the end of the calendar year. Additionally, hook and line fishermen would have the opportunity to supply the winter market for black sea bass and take advantage of higher market prices.

As noted in **Section 3.3.3**, marine mammal protection has broad social effects as well, as conservation of endangered species can produce societal benefits by protecting species for aesthetic, economic, scientific, and historical value to the U.S. and citizens. Maintaining the seasonal closure for the pot fishery under **Alternative 1 (No Action)** could result in broad social benefits through improved protection of right whales during migration to and from calving grounds during the winter more so than modification to the closure area or period (**Alternatives 2-9b**). As discussed in **Appendix E**, the potential interaction with right whales is expected to be lower for alternatives with pot prohibitions that encompass larger areas and/or time periods during November through April. However, because the baseline value of potential interaction is unknown, the actual increase or decrease in potential interactions cannot be determined, so that any associated social benefits would also be unknown. With all other regulations and management measures in place for the black sea bass pot fishery that contribute to minimizing potential interactions through Council actions and ALWTRP requirements (see **Section 1.6**), the return on investment of additional restrictions such as a spatial/temporal prohibition on black sea bass pot fishing could be low, particularly for a relatively small fishery such as the black sea bass pot fishery. Overall, any social benefits that would be expected to result from improved right whale protection will only be realized when biological benefits to the right whales can be measured and demonstrated.

The effects of **Alternatives 2-9b** on fishermen and associated communities vary with the temporal and spatial characteristics of the closures. **Alternative 2** would likely be the most beneficial for the pot fishermen by allowing them to fish during the winter months, but would also contribute to a faster rate of harvest and early in-season closure, which would affect not only the pot fishing businesses but also the hook and line fishermen, dealers, and fish house owners. **Alternative 3** would provide an additional four weeks to the current fishing season for pots and allow pots to be fished outside of the right whale designated critical habitat, so that pot fishermen could take advantage of the increased ACL. Depending on the areas that could be closed to pot fishing and actual areas where fishermen place their pots, **Alternatives 3-7** all provide some way for pot fishing to continue to some degree in the winter months, and would be expected to generate some of the same benefits to pot fishermen as under **Alternative 2.** However, all possible negative effects under **Alternative 2** due to an earlier in-season closure would be expected under **Alternatives 3-7** as well.

Alternative 8 would be most beneficial to pot fishermen in North Carolina and South Carolina, which is where the largest proportion of pot endorsement holders are found and landings occur. **Alternative 8b** would provide more accessibility than **Alternative 8a** by allowing North Carolina and South Carolina pot fishermen to continue fishing to some degree in areas not included in the closure. However, **Alternative 8** would not benefit Florida pot fishermen, and allowing harvest in the primary areas for black sea bass pot fishing could result in the negative effects described for **Alternative 2**.

4.1.4 Administrative Effects

To Be Completed

4.2 Action 2 – Modify black sea bass pot gear marking requirements

4.2.1 Biological Effects

Action 2 Alternatives[1]
(preferred alternatives in bold)

1. No action. Status quo gear marking requirements.
2. Buoy line strength less than or equal to 2,200 lbs and a weak link less than or equal to 400 lbs.
3. A 2-inch wide colored band will be added at the center of each required 12-inch colored mark.

[1]See Chapter 2 for a more detailed description of the alternatives.

Black Sea Bass

The alternatives range from maintaining the current pot gear requirements to specifying buoy line strength and decreasing weak link breaking weight to adding an extra marking on the buoy line. Regardless of which alternative the South Atlantic Council chooses, no biological impacts to the black sea bass stock are expected. Adverse effects are prevented because overall harvest in the commercial sector is limited to the commercial ACL; commercial accountability measures are also in place. The ACL is reduced from the overfishing level as required to address assessment uncertainty. In addition, there is no evidence to suggest that changing the gear requirements for the black sea bass pot fishery would have adverse biological impacts. These alternatives are not predicted to reduce harvest and would not provide additional protection to the black sea bass stock. Therefore, there is no difference in the biological effects on black sea bass from the alternatives.

Protected Resources

The overall effect of **Alternatives 2** and **3** on protected resources is unknown. The South Atlantic black sea bass pot fishery is listed as a Category II fishery by the NMFS Large Whale Take Reduction Plan due to potential interactions with endangered species including fin and humpback whales (CFR 2014). Pot gears in other areas are Category I fisheries and have been documented to cause serious injury and death to North Atlantic right whales (Johnson et al. 2005, Knowlton et al. 2012). Currently there are no published documents citing serious injury or death of large whales due to interactions with black sea bass pot gear in the South Atlantic; however, it cannot be ruled out as a fishery with interactions because determining the fishery that interacted with a whale is difficult (NMFS 2014).

Comment [G4]: Add to references

Comment [G5]: Add to references

Alternative 2 would keep the same vertical line breaking strength in the Large Whale Take Reduction plan for Federal waters in the Southeast Restricted Area North (≤ 2,200 lbs) but would reduce the weak link breaking strength from ≤600 lbs to ≤400 lbs. The reduced weak link strength may provide additional protections to young calves if an interaction were to occur.

Alternative 3 provides a mechanism to identify the black sea bass pot fishery if a line entangles a whale. Not all gear remains on the individual after an interaction occurs. This alternative provides a mechanism to identify the black sea bass pot fishery if an interaction occurs and if the gear remains entangled on the whale. This gear marking would be in addition to the gear marking required in the Large Whale Take Reduction Plan (**Table 4.2.1.1**).

Neither of these alternatives would reduce the potential of interaction between a black sea bass pot and right whales. The alternatives would reduce the potential of serious injury or mortality (**Alternative 2**) and potentially identify or eliminate the black sea bass pot fishery as a gear with an entanglement (**Alternative 3**).

Table 4.2.1.1. Area specific gear marking requirements from the Large Whale Take Reduction Team and includes both pots and gillnets.

Gear Marking Color	Applicable Gillnet Management Area
RED	• Massachusetts Restricted Area • Northern Nearshore Trap/Pot Waters • Northern Inshore State Trap/Pot Waters • Stellwagen Bank Jeffreys Ledge Restricted Area • Great South Channel Restricted Area overlapping Lobster Management Area (LMA) 2 and/or the Outer Cape (OC) LMA.
ORANGE	• Southern Nearshore Trap/Pot Waters.
BLACK	• Offshore Trap/Pot Waters; Great South Channel Restricted Area overlapping with the LMA 2/3 Overlap and/or LMA 3
BLUE & ORANGE	• Southeast Restricted Area North (state waters)
GREEN & ORANGE	• Southeast Restricted Area North (Federal waters)
GREEN	• Cape Cod Bay Restricted Area • Great South Channel Restricted Gillnet Area • Great South Channel Sliver Restricted Gillnet Area • Stellwagen Bank/Jeffreys Ledge Restricted Area • Other Northeast Gillnet Waters (Northeast & Mid-Atlantic)
BLUE	• Mid/South Atlantic Gillnet Waters
YELLOW	**Excluding Shark Gillnet:** • Southeast US Restricted Area South* • Other Southeast Gillnet Waters*
GREEN & BLUE	**Shark Gillnet (with webbing of 5" or greater)** • Southeast US Monitoring Area* • Southeast US Restricted Area South* • Other Southeast Gillnet Waters*

* Southeast gillnet management areas also require that each gillnet panel be marked along both the floatline and the leadline at least once every 100 yards, unless otherwise required.

4.2.2 Economic Effects

Action 2 proposes to modify gear requirements for back sea bass pots. The type of gear modifications being considered involve an initial one-time expense and future expenses incurred as a result of this action would be related to ongoing maintenance. All black sea bass pot endorsement holders would be required to switch out the weak links attached to their traps. Currently, a 600-lb strength weak link is permitted. Presumably, **Alternative 3** which would only require additional marking on the buoy line would not affect the functionality of the gear.

The estimates of costs associated with **Alternatives 2** and **3** assume that all fishermen would be affected by the additional gear requirements. However, what is not known is how many fishermen have gear that already would meet the additional requirements. Therefore, the estimates in this analysis represent the maximum costs expected.

There are 32 Black Sea Bass Pot Endorsements in the South Atlantic. North Carolina fishermen hold 17 active or renewable endorsements (http://sero.nmfs.noaa.gov/operations_management_information_services/constituency_services_branch/freedom_of_information_act/common_foia/SBPE.htm, accessed on January 29, 2015). Cost estimates were based on values obtained from HamiltonMarine.com (accessed on January 29, 2015).

Alternative 2 would require minimum line breaking strength of 2,400 lbs for North Carolina, which is already a requirement for South Carolina, Georgia, and Florida (**Alternative 1 – No Action**). A typical black sea bass pot buoy line is 100 to 130' in length (Jack Cox, pers. comm.) Assuming all 17 North Carolina fishermen had 35 pots and needed to replace all the buoy lines, at 125' per pot, to buy four bundles of line would cost $716 per fisherman.

Alternative 2 would require a step-down from 600 to 400-lb strength weak link. One potential side effect of this step-down in weak links could be an increased probability of the links breaking and resulting in gear loss. However, the probability of such occurrences cannot be estimated at this time. All 32 endorsement holders in all four states could be required to buy new weak links as the current required links have a 600 lb breaking strength. The cost for new weak links for each fisherman is estimated to be $100. The total maximum cost associated with **Alternative 2** for all fishermen combined is $26,112.

Alternative 3 would require fishermen to mark 2" bands on each buoy line. If using paint, it is assumed that one quart of marine buoy paint would be sufficient to paint the bands on 35 traps. The cost for a quart of marine buoy paint is $47.35. The total maximum cost associated with **Alternative 3** for all fishermen combined is $1,515.

Because of the potential need to buy new buoy line, North Carolina fishermen could see an average one-time cost of $763 should both **Alternatives 2** and **3** be chosen as preferred alternatives. Black sea bass pot endorsement holders from South Carolina, Georgia, or Florida could see an average one-time cost of $147 ($100 for weak links + $47 for buoy paint) should both **Alternatives 2** and **3** be chosen as preferred alternatives.

4.2.3 Social Effects

4.2.4 Administrative Effects

Chapter 5. Council Rationale

5.1 Snapper Grouper Advisory Panel Comments and Recommendations

From their November 2013 meeting
Council staff reviewed alternatives to address the proposed annual closure of black sea bass pots from November 1 to April 30. Regulatory Amendment 19 implemented this regulation as well as an increase to the black sea bass ACL. The AP discussed the feasibility of the pot closure only applying within designated Right Whale Critical Habitat. Some of the AP members from North Carolina indicated that migratory whales are frequently encountered in water 30-60 feet deep off the NC coast. Migrating whales are distributed from the Gulf of Maine south in spring and fall and congregate on calving grounds. The number of black sea bass pots the whales encounter in the South Atlantic is minuscule relative to the number of pots in the Gulf of Maine.

The AP approved the following motion:
MOTION: RECOMMEND ALTERNATIVE 4 AS PREFERRED
Alternative 4. Prohibit retention, possession, and fishing for black sea bass using black sea bass pot gear, annually, from November 1 to April 30, in designated right whale critical habitat in the South Atlantic region.

From their April 2014 meeting
The AP recommended that the closure on the use of pots be limited to designated Right Whale Critical Habitat in the South Atlantic region. The AP made no further recommendations on the amendment but reiterated that vertical lines in the northeast lobster fishery pose a much more severe threat to whales than black sea bass pots and questioned why there are no restrictions in place for the northeast lobster fishery.

From their October 2014 meeting
No analyses were available for the AP to comment on.
The following are highlights from the discussion:

- Concerns that the Council has not been given credit thus far for measures that have been implemented, e.g., endorsement program for pots, restriction on number of pots and soak time, etc.
- There have been no documented interactions between black sea bass pots and right whales.
- Amendment 18A drastically reduced effort effectively creating a day-boat fishery. Common sense indicates that there is very little risk to whales, especially since there has not been a single interaction between a whale and black sea bass pot even when the number of pots in the water was much larger and with longer soak times.
- While effort could potentially shift based on the area that is closed, it is very unlikely.
- Price of black sea bass is higher in winter. NC wants their winter fishery back.

The AP approved the following motions:
MOTION: RECOMMEND ALTERNATIVE 2 AS PREFERRED
Alternative 2. Remove the annual November 1 through April 30 prohibition on the retention, possession, and fishing for black sea bass using black sea bass pot gear.

MOTION: RECOMMEND THAT THE COUNCIL CONSIDER A SEPARATE ACL FOR THE COMMERCIAL HOOK AND LINE SECTOR FOR BLACK SEA BASS IF THE CURRENT CLOSURE ON BLACK SEA BASS POTS IS REMOVED.

5.2 Law Enforcement Advisory Panel Comments and Recommendations

From their March 2014 meeting
The Law Enforcement Advisory Panel (LEAP) received a general overview of the alternatives proposed under Regulatory Amendment 16 during their March 3, 2014 meeting. The LEAP did not express concerns or provide recommendations. One LEAP member, however, stated that the annual closure of black sea bass pots is negatively impacting North Carolina fishermen who hold endorsements to fish for black sea bass using pot gear.

From their March 2015 meeting
The AP is meeting on March 2, 2015 and their recommendations will be added.

5.3 Scientific and Statistical Committee Comments and Recommendations

The SSC met in October 2014 and discussed Snapper Grouper Regulatory Amendment 16. **The following is directly quoted from the report:**

The SSC reviewed the analysis of Regulatory Amendment 16 alternatives conducted by SERO staff. The most relevant comments, concerns, and discussion points brought up during the SSC meeting included:

- *The SSC expressed concern about the lack of detail in uncertainty characterizations in the analysis. Several sensitivity runs were conducted to evaluate major uncertainties. However, the Committee expressed concern with the ability to discern differences between management alternatives given the information provided. The Committee advised that further exploration and reporting of within-model uncertainties would improve insight into the variability associated with model parameters and help to distinguish between the different alternatives considered. The SSC recognizes that conducting a more complete, in-depth uncertainty characterization would provide a more robust picture of the proposed management alternatives given the amount of uncertainty in model outputs. At the very least it would be useful to explore uncertainty in a subset of runs and give a better picture of how well this analysis can distinguish between alternatives.*

- *Dr. Nick Farmer explained that rerunning the original model using bootstrapping or MCMC technique is not feasible given the current timeline for the amendment. However, the SSC recommended clearly defining this particular deficiency in the analysis such that the Council understands that the ranking of considered alternatives might not hold true if a full uncertainty analysis was undertaken.*

Overall, the SSC felt the presentation was informative. The approach of ranking the alternatives on a relative scale was supported. Inferring that the analysis evaluates and quantifies risk to whale encounters was not supported. With some refinement, directed at providing information on error associated with estimated scalar values for the alternatives, the analysis could allow the Council to distinguish between the different alternatives.

The SSC cautioned that assuming model output of co-occurrence between black sea bass pot effort and whale sightings is a proxy for whale interaction or entanglement overstates model and data capabilities. The Committee recommended presenting the scalar as a dimensionless value to avoid potential misunderstandings and misuse of the term 'risk'.

In terms of next steps regarding this issue the SSC provided the following recommendations:

1. *Convene an SSC ad hoc sub-Committee to advise Dr. Nick Farmer (SERO) on uncertainty analyses to more reliably distinguish between alternatives.*
2. *The SSC recommends an analysis of relative sea bass gear-whale sighting encounter scalar values (relative to alternative 2) that consider historic as well as current levels of effort.*
3. *The SSC also requested that a staff member from NMFS Protected Resources Division attend the next SSC meeting to address Committee questions and clarify how these types of analyses are used to create a Biological Opinion and guide management.*

5.4 Public Comments and Recommendations

To Be Completed

5.5 South Atlantic Council Choice for Preferred Alternative

To Be Completed

Chapter 6. Cumulative Effects

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

6.1 Biological

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

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:

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

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

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

2. Establish the geographic scope of the analysis.

The immediate impact area would be the federal 200-mile limit of the Atlantic off the coasts of North Carolina, South Carolina, Georgia, and east Florida to Key West, which is also the South Atlantic Fishery Management Council's (South Atlantic Council) area of jurisdiction. In light of the available information, the extent of the boundaries would depend upon the degree of fish immigration/emigration and larval transport, whichever has the greatest geographical range. Therefore, the proper geographical boundary to consider effects on the biophysical environment is larger than the entire South Atlantic exclusive economic zone (EEZ). 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.

A. Establish the timeframe for the analysis.

The timeframe for the analysis of cumulative effects is 1999 through the present. Fishery managers implemented the first significant regulations pertaining to blueline tilefish in 1999 through Amendment 9 to the Snapper Grouper FMP (Amendment 9; SAFMC 1998). The regulations included a five fish aggregate grouper bag limit, which included blueline tilefish. In addition, fishery managers implemented a regulation where vessels with longline gear aboard may only possess snowy grouper, warsaw grouper, yellowedge grouper, misty grouper, golden tilefish, blueline tilefish, and sand tilefish.

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

A. Fishery-related actions affecting the snapper grouper species addressed in this amendment

A. Past

The reader is referred to **Appendix B** for past regulatory activity all species in the Snapper Grouper FMP. Past regulatory activity for the relevant snapper grouper species in this amendment is listed below.

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

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

Amendment 15B to the Snapper Grouper FMP (Amendment 15B; SAFMC 2008b) became effective on December 16, 2009. Management measures in Amendment 15B included a prohibition of the sale of bag limit caught snapper grouper species for fishermen not holding a federal commercial permit for South Atlantic snapper grouper; an action to adopt, when implemented, the Atlantic Coastal Cooperative Statistics Program release, discard and protected species module to assess and monitor bycatch, allocations for snowy grouper, and management reference points for golden tilefish. Biological benefits from Amendment 15B are not expected

to result in a significant cumulative biological effect when added to anticipated biological impacts under this amendment. The South Atlantic Council approved Amendment 15B at their June 2008 meeting. The final rule published in the *Federal Register* on November 16, 2009, and became effective on December 16, 2009.

Amendment 17B to the Snapper Grouper FMP (Amendment 17B; SAFMC 2010b), which was implemented on January 31, 2011, established annual catch limits (ACL), annual catch targets, and accountability measures (Ams) for 8 species experiencing overfishing; modified management measures to limit total mortality to the ACL; and updated the framework procedure for specification of total allowable catch. Amendment 17B also prohibited the harvest and possession of deepwater snapper grouper species (snowy grouper, blueline tilefish, yellowedge grouper, misty grouper, queen snapper, and silk snapper) at depths greater than 240 feet. The intent of this measure was to reduce bycatch of speckled hind and warsaw grouper. The South Atlantic Council approved Amendment 17B at their September 2010 meeting. The final rule published in the *Federal Register* on December 30, 2010.

Regulatory Amendment 9 to the Snapper Grouper FMP (SAFMC 2011a) reduced the black sea bass recreational bag limit from 15 fish per person per day to 5 fish per person per day. The final rule published in the *Federal Register* on June 15, 2011.

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

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

ADD REG 19

B. Present

In addition to snapper grouper fishery management issues being addressed in this amendment, other snapper grouper amendments have been developed concurrently and are in the process of approval and implementation.

The Joint Dealer Reporting Amendment has been approved for Secretarial Review by the Gulf of Mexico and South Atlantic Fishery Management Councils. This amendment is intended to improve the timeliness and accuracy of fisheries data reported by permitted dealers. The amendment would also create one dealer permit for all federally-permitted dealers in the southeast region. Requiring dealers to report landings data weekly will help to improve in-season quota monitoring efforts, which will increase the likelihood that Ams could be more effectively implemented prior to ACLs being exceeded. The notice of availability of the amendment and the proposed rule published on December 19, 2013, and January 2, 2014, respectively.

The South Atlantic Headboat Reporting Amendment requires that all federally-permitted headboats on the South Atlantic report their landings information electronically, and on a weekly basis in order to improve the timeliness and accuracy of harvest data. The proposed rule published in the *Federal Register* on September 27, 2013. The final rule published on December 27, 2013, and regulations became effective on January 27, 2014.

At their September 2012 meeting, the Council directed staff to develop Amendment 27 to the Snapper Grouper FMP to address issues related to blue runner, and extension of management into the Gulf of Mexico for Nassau grouper. The proposed rule published in the *Federal Register* on September 27, 2013. The final rule published on December 27, 2013, and regulations became effective on January 27, 2014.

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

C. Reasonably Foreseeable Future

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

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

At their June 2012 meeting, the Council further discussed Amendment 22 to the Snapper Grouper FMP to consider measures such as a tag program to allow harvest of red snapper as the stock rebuilds. Scoping of Amendment 22 was conducted during January and February 2011.

At their September 2012 meeting, the Council stated their intent to further develop Amendment 22 in 2013 focusing on a recreational tag program for red snapper, golden tilefish, snowy grouper and wreckfish. In June 2013, the Council changed to focus of Amendment 22 to a recreational tag program to monitor harvest of species with small ACLs.

At their June 2013 meeting, the Council requested development of Regulatory Amendment 16 to the Snapper Grouper FMP to adjust management measures for black sea bass by removing the November through April prohibition on the use of black sea bass pots in Regulatory Amendment 19 (SAFMC 2013f). An options paper was reviewed by the Council in September 2013. The Council held scoping meetings in January 2014. **Appendix N** describes the results of the scoping process.

At their September 2012 meeting, the Council requested development of Regulatory Amendment 17 to the Snapper Grouper FMP to consider MPAs to provide additional protection for speckled hind and warsaw grouper. This action was previously considered in Comprehensive Ecosystem-Based Amendment 3. The Council discussed the regulatory amendment in September 2013. The Council will hold scoping meetings in 2014.

The Council requested development of Regulatory Amendment 14 to the Snapper Grouper FMP at their September 2013 meeting. Options included in Regulatory Amendment 14 are: changes in the fishing years for greater amberjack and black sea bass; changes in Ams for vermilion snapper and black sea bass; and modification of the gag trip limit.

At their June 2013 meeting, the Council began development of Amendment 29 to the Snapper Grouper FMP, which would consider adjustments to the ABCs for data poor snapper grouper species, and management measures for gray triggerfish. Public hearings took place in January 2014, and the Council is expected to take final action in June 2014.

At their December 2013 meeting, the Council began development of Regulatory Amendment 21 to the Snapper Grouper FMP, which would consider redefining the minimum stock size threshold for species, including blueline tilefish, with small natural mortality rates. The Council also began development of Amendment 32 to the Snapper Grouper FMP, which would include actions to end overfishing of blueline tilefish and rebuild the stock.

Once stock assessments are completed for mutton snapper and snowy grouper, the Council will begin development of an amendment to update the ACLs.

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.

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

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

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

In terms of the biophysical environment, the resources/ecosystems identified in earlier steps of the CEA are the fish populations directly or indirectly affected by the regulations. This step should identify the trends, existing conditions, and the ability to withstand stresses of the environmental components. Information on species most affected by this amendment are provided in **Section 3.2** 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 the affected species, ecosystems, and human communities 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

This document updates thresholds already specified for black sea bass to ensure future overfishing does not occur, and to ensure these stocks can be maintained at sustainable levels. With current AMs in place for both species it is unlikely that these thresholds would be exceeded. If the harvest limits are exceeded, management measures are in place to either restrict further fishing or correct for the overage in the following fishing season.

Climate change

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

It is unclear how climate change would affect snapper grouper species in the South Atlantic. Climate change can affect factors such as migration, range, larval and juvenile survival, prey availability, and susceptibility to predators. In addition, the distribution of native and exotic species may change with increased water temperature, as may the prevalence of disease in keystone animals such as corals and the occurrence and intensity of toxic algae blooms. Climate change may significantly impact snapper grouper species in the future, but the level of impacts cannot be quantified at this time, nor is the time frame known in which these impacts will occur. In the near term, it is unlikely that the management measures contained in Regulatory Amendment 16 would compound or exacerbate the ongoing effects of climate change on snapper grouper species.

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

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

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

The cause and effect relationship of fishing and regulatory actions is shown in **Table 6.1**.

Table 6.1. The cause and effect relationship of fishing and regulatory actions within the time period of the Cumulative Effects Analysis (CEA).

Time period/dates	Cause	Observed and/or Expected Effects
Pre-January 12, 1989	Habitat destruction, growth overfishing of vermilion snapper.	Damage to snapper grouper habitat, decreased yield per recruit of vermilion snapper.
January 1989	Trawl prohibition to harvest fish (Snapper Grouper Amendment 1; SAFMC 1988).	Increase yield per recruit of vermilion snapper; eliminate trawl damage to live bottom habitat.
Pre-January 1, 1992	Overfishing of many snapper grouper species.	Spawning stock ratio of these species is estimated to be less than 30% indicating that they are overfished.
January 1992	Prohibited gear: fish traps south of Cape Canaveral, FL; entanglement nets; longline gear inside of 50 fathoms; powerheads and bangsticks in designated SMZs off SC. Size/Bag limits: 10" TL vermilion snapper (recreational only); 12" TL vermilion snapper (commercial only); 10 vermilion snapper/person/day; aggregate grouper bag limit of 5/person/day; and 20" TL gag, red, black, scamp, yellowfin, and yellowmouth grouper size limit (Snapper Grouper Amendment 4; SAFMC 1991).	Reduce mortality of snapper grouper species.
Pre-June 27, 1994	Damage to *Oculina* habitat.	Noticeable decrease in numbers and species diversity in areas of *Oculina* off FL
July 1994	Prohibition of fishing for and retention of snapper grouper species (HAPC renamed Oculina Experimental Closed Area (OECA). Snapper Grouper Amendment 6; SAFMC 1993.	Initiated the recovery of snapper grouper species in OECA.
1992-1999	Declining trends in biomass and overfishing continue for a number of snapper grouper species including golden tilefish.	Spawning potential ratio for golden tilefish is less than 30% indicating that they are overfished.
July 1994	Snapper Grouper Amendment 6; SAFMC 1993.	Commercial quota for golden tilefish; commercial trip limits for golden tilefish; include golden tilefish in grouper recreational aggregate bag limits.
February 24, 1999	Snapper Grouper Amendment 6; SAFMC 1993.	All S-G without a bag limit: aggregate recreational bag limit 20 fish/person/day, excluding tomtate and

Time period/dates	Cause	Observed and/or Expected Effects
		blue runners. Vessels with longline gear aboard may only possess snowy, warsaw, yellowedge, and misty grouper, and golden, blueline and sand tilefish.
Effective October 23, 2006	Stock assessments indicate black sea bass vermilion snapper, red porgy, and snowy grouper are undergoing overfishing. Snapper grouper FMP Amendment 13C (SAFMC 2006)	Management measures implemented to end overfishing of these species.
Effective February 12, 2009	Recognized need to provide additional protection to deep-water snapper grouper species, and to protect spawning locations. Snapper grouper FMP Amendment 14 (SAFMC 2007).	Use MPAs as a management tool to promote the optimum size, age, and genetic structure of slow growing, long-lived deep-water snapper grouper species (e.g., speckled hind, snowy grouper, warsaw grouper, yellowedge grouper, misty grouper, golden tilefish, blueline tilefish, and sand tilefish). Gag and vermilion snapper occur in some of these areas.
Effective March 20, 2008	Stock assessments indicate snowy grouper, black sea bass, and red porgy are overfished. Snapper grouper FMP Amendment 15A (SAFMC 2008a).	Establish rebuilding plans and SFA parameters for snowy grouper, black sea bass, and red porgy.
Effective Dates Dec 16, 2009, to Feb 16, 2010.	Concern that bag limit sales of snapper grouper species obfuscates accurate reporting of landings data. Snapper grouper FMP Amendment 15B (SAFMC 2008b).	End double counting in the commercial and recreational reporting systems by prohibiting the sale of bag-limit caught snapper grouper, and minimize impacts on sea turtles and smalltooth sawfish.
Effective Date July 29, 2009	Stock assessment indicates gaga is experiencing overfishing and is approaching an overfished condition. 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	Stock assessment indicated red snapper is overfished and undergoing overfishing. Red Snapper Interim Rule.	Prohibit commercial and recreational harvest of red snapper from January 4, 2010, to June 2, 2010 with a possible 186-day extension. Reduce overfishing of red snapper while long-term measures to end overfishing are addressed in Amendment 17A.
Effective Dates June 3, 2010, to Dec 5, 2010	Stock assessment indicated red snapper is overfished and undergoing overfishing. Extension of Red Snapper Interim Rule	Extended the prohibition of red snapper to reduce overfishing of red snapper while long-term measures to end overfishing are addressed in Amendment 17A.
Effective Date December 4, 2010	Stock assessment indicated red snapper is overfished and undergoing overfishing. Snapper Grouper FMP Amendment 17A (SAFMC 2010a).	Specified SFA parameters for red snapper; ACLs and ACTs; management measures to limit recreational and commercial sectors to their ACTs;

Time period/dates	Cause	Observed and/or Expected Effects
		accountability measures. Establish rebuilding plan for red snapper. Large snapper grouper area closure inn EEZ of NE Florida. Emergency rule delayed the effective date of the snapper grouper closure.
Effective Date January 31, 2011	Reauthorized Magnuson-Stevens Act requires ACLs for all species undergoing overfishing. Snapper Grouper Amendment 17B (SAFMC 2010b).	Specified ACLs and ACTs; management measures to limit recreational and commercial sectors to their ACTs; AMs, for species undergoing overfishing. Established a harvest prohibition of six snapper grouper species in depths greater than 240 feet.
Effective Date June 1, 2011	New red snapper assessment indicates stock is undergoing overfishing and is overfished but area closures approved in Amendment 17B are not needed. Regulatory Amendment 10 (SAFMC 2010c).	Removed of snapper grouper area closure approved in Amendment 17A.
Effective Date July 15, 2011	Additional management measures are considered to help ensure overfishing of black sea bass, vermilion snapper, and gag does not occur. Desired to have management measures slow the rate of capture to prevent derby fisheries. Regulatory Amendment 9 (SAFMC 2011a)	Harvest management measures for black sea bass; commercial trip limits for gag, vermilion snapper, and greater amberjack
Effective Date May 10, 2012	New analysis demonstrates prohibition to harvest of 6 deep-water species in Amendment 17B is not an effective measure to reduce bycatch of speckled hind and warsaw grouper. Regulatory Amendment 11 (SAFMC 2011b)	Removed the harvest prohibition of six deep-water snapper grouper species implemented in Amendment 17B.
Effective Date April 16, 2012	Reauthorized Magnuson-Stevens Act requires ACLs for species not undergoing overfishing. Comprehensive ACL Amendment (SAFMC 2011c).	ACLs ACTs, and AMs for species not experiencing overfishing; accountability measures; an action to remove species from the fishery management unit as appropriate; and management measures to limit recreational and commercial sectors to their ACTs.
Effective Date July 11, 2012	Stock assessment indicates red grouper is overfished and undergoing overfishing. Amendment 24 (Red Grouper) (SAFMC 2011d).	Established a rebuilding plan for red grouper, specified ABC, and established ACL, ACT and revised AMs for the commercial and recreational sectors.
Effective Date July 1, 2012	Need to slow rate of harvest in black sea bass pot sector to ease derby conditions. Amendment 18A (SAFMC 2012a).	Established an endorsement program for black sea bass commercial sector; established a trip limit; specified requirements for deployment and retrieval of pots; made improvements to data reporting for commercial and

Time period/dates	Cause	Observed and/or Expected Effects
		for-hire sectors
Effective Dates: September 17, 2012 (commercial); September 14, 2012 (recreational)	As red snapper stock rebuilds some limited harvest of red snapper can occur, as long as rebuilding is not compromised. Temporary Rule through Emergency Action (Red snapper).	Established limited red snapper fishing seasons (commercial and recreational) in 2012.
Effective Date January 7, 2013	Clarification of action in Amendment 18A for black sea bass pot endorsement transferability was needed. Amendment 18A Transferability Amendment.	Reconsidered action to allow for transfer of black sea bass pot endorsements that was disapproved in Amendment 18A.
Effective Date October 26, 2012	Some wreckfish catch shares have become available over time. Amendment 20A (Wreckfish) (SAFMC 2012b).	Redistributed inactive wreckfish shares.
Effective Date October 9, 2012	Stock assessment indicates golden tilefish overfishing has been ended and catch levels can be increased. Regulatory Amendment 12 (SAFMC 2012c).	Adjusted the golden tilefish ACL based on the results of a new stock assessment and modified the recreational golden tilefish AM.
Effective Date May 23, 2013	There is a need to reduce effort in the commercial longline sector that targets golden tilefish to ease derby conditions. Snapper Grouper Amendment 18B (SAFMC 2013a)	Establish a commercial longline endorsement program for golden tilefish; establish an appeals process; allocate the commercial ACL by gear; establish trip limit for the hook-and-line sector.
Target 2014	There is a need to control recreational harvest of snapper grouper species with very small ACLs. Snapper Grouper Amendment 22 (under development).	Develop a recreational tag program for snapper grouper species in the South Atlantic.
Effective Date July 17, 2013	The recreational data collection system has changed from MRFSS to MRIP. ACLs and allocations in place utilize MRFSS data. Regulatory Amendment 13. (SAFMC 2013b).	Adjust ACLs and allocations for unassessed snapper grouper species with MRIP recreational estimates
Effective Date January 27, 2014	Blue runner are caught primarily in state waters of FL, and it is not clear if federal management is needed. Nassau grouper is no longer managed by Gulf Council. Council would like to be able to make adjustment to ACLs more quickly after a stock assessment has been completed. Snapper Grouper Amendment 27 (Approved by Council).	Establish the Council as the managing entity for yellowtail and mutton snappers and Nassau grouper in the Southeast U.S., modify the SG framework; modify placement of blue runner in an FMU or modify management measures for blue runner
Effective Date August 23, 2013	As the red snapper stock rebuilds, some allowable harvest could occur if rebuilding is not affected. Snapper Grouper Amendment 28 (SAFMC 2013d).	Modify red snapper management measures including the establishment of a process to determine future annual catch limits and fishing seasons.

Time period/dates	Cause	Observed and/or Expected Effects
Target 2014	Council's SSC has identified new methods to estimate ABC for data poor species. Snapper Grouper Amendment 29 (under development).	Update ABCs, ACLs, and ACTs for snapper grouper species based on recommendations from SSC.
Effective Date September 12, 2013	New stock assessments completed for vermilion snapper and red porgy. Regulatory Amendment 18 (SAFMC 2013e).	Adjust ACLs and management measure for vermilion snapper and red porgy based on results from new update assessment.
Effective Date September 23, 2013	New stock assessment for black sea bass indicates the stock is rebuilt and catch levels can be increased. Regulatory Amendment 19 (SAFMC 2013f).	Increase recreational and commercial ACLs for black sea bass. Black sea bass pots prohibited from November 1 through April 30 (effective October 23, 2013).
Effective Date September 5, 2013	New stock assessment indicates catch levels of yellowtail snapper can be increased. Accountability measures for gag can be adjusted because effective means are in place to ensure overfishing does not occur. Regulatory Amendment 15 (SAFMC 2013c).	Increase yellowtail snapper ACL, remove accountability measure for gag that closes commercial harvest for all shallow water grouper species when the gag ACL is met. Reduce gag ACL to account for dead discards when fishermen target co-occurring shallow water grouper species.
Effective Date January 27, 2014	Southeast Fisheries Science Center has established a program that allows headboats to report landings through electronic means. Generic For-Hire Reporting Amendment (Approved by Council).	Require all federally-permitted headboats in the South Atlantic to report landings information electronically and on a weekly basis.
Target 2014	Joint Commercial Logbook Reporting Amendment	Require all federally-permitted commercial fin fish fishermen in the southeast to report electronically.
Target 2014	Regulatory Amendment 14	Change the fishing years for greater amberjack and black sea bass, change in AMs for vermilion snapper and black sea bass, and modify the gag trip limit.
Target 2014	Generic AM and dolphin allocation amendment.	Modify AMs for snapper grouper species and golden crab. Modify allocations for dolphin.
Target 2014/2015	Joint Charterboat Reporting Amendment	Require all federally-permitted charterboats to report landings information electronically.

9. Determine the magnitude and significance of cumulative effects.

When species in the snapper grouper fishery management unit are assessed, stock status may change as new information becomes available. In addition, changes in management regulations, fishing techniques, social/economic structure, etc. can result in shifts in the percentage of harvest between user groups over time. As such, the Council has determined that certain aspects of the

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

The cumulative effects of the actions are not expected to significantly affect the magnitude of bycatch, diversity and ecosystem structure of fish communities, or safety at sea of fishermen targeting snapper grouper, and other species managed by the Council. Based on the cumulative effects analysis presented herein, the proposed actions will not have any significant cumulative impacts combined with other past, present, and foreseeable future actions.

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

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

The cumulative effects on the biophysical environment are expected to be negligible. Avoidance, minimization, and mitigation are not necessary for the successful implementation of the proposed actions in this amendment.

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

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

No specific observer program is in place for the 32 permits in the black sea bass pot fishery; however. In the programs described below, any gear recovered from an animal is analyzed to try and determine which fishery caused the entanglement. Because of the difficulty of identifying a specific fishery from the entangling gear, very few entanglements are identified beyond the gear type (i.e., a trap/pot or gillnet gear entanglement, without indicating a specific fishery).

NMFS authorizes organizations and volunteers in the Marine Mammal Stranding Program to respond to marine mammal strandings throughout the United States. Stranding network participants are trained to respond to, and collect samples from live and dead marine mammals that strand along southeastern United State beaches. As part of the network, the SEFSC coordinates stranding events, monitors stranding rates, monitors human-caused mortalities, and

maintains a stranding database for the region, among other things. The Atlantic Large Whale Disentanglement Network responds to reports of entangled whales and attempts to remove entangling gear when possible. The network includes numerous governmental and non-governmental agencies, fishermen, and other trained individuals from Canada to Florida. Additionally, the MMPA and the Marine Mammal Authorization Program require that all commercial fishermen report all incidental injuries and mortalities of marine mammals that have occurred as a result of commercial fishing operations. Those reports must be sent to NMFS within 48 hours of the end of a fishing trip in which the serious injury or mortality occurred, or, for non-vessel fisheries, within 48 hours of the occurrence.

6.2 Socioeconomic

To Be Completed

Chapter 7. List of Preparers

Table 7.1.1. List of Regulatory Amendment 16 preparers

Name	Organization	Title
Andy Herndon	NMFS/PR	Protected Resources Biologist
Chip Collier	SAFMC	Fishery Biologist
Brian Cheuvront	SAFMC	Economist
Heather Blough	NMFS/SER	Acting Regional NEPA Coordinator
Gregg Waugh	SAFMC	Deputy Executive Director
Jack McGovern	NMFS/SF	Fishery Biologist
Jessica Powell	NMFS/PR	Protected Resources Biologist
Kari MacLauchlin	SAFMC	Fishery Social Scientist
Mike Errigo	SAFMC	Data Analyst
Mike Jepson	NMFS/SF	Fishery Social Scientist
Nick Farmer	NMFS/SF	Fishery Biologist
Rick DeVictor	NMFS/SF	Fishery Biologist
Tony Lamberte	NMFS/SF	Economist

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

Table 7.1.2. List of Regulatory Amendment 16 interdisciplinary plan team members.

Name	Organization	Title
Andy Herndon	NMFS/PR	Protected Resources Biologist
Chip Collier	SAFMC	Fishery Biologist
Brian Cheuvront	SAFMC	Economist
David Dale	NMFS/HC	EFH Specialist
Heather Blough	NMFS/SER	Acting Regional NEPA Coordinator
Gregg Waugh	SAFMC	Deputy Executive Director
Jack McGovern	NMFS/SF	Fishery Biologist
Jessica Powell	NMFS/PR	Protected Resources Biologist
Kari MacLauchlin	SAFMC	Fishery Social Scientist
Lance Garrison	NMFS/SEFSC	Research Biologist
Scott Crosson	NMFS/SEFSC	Economist
Mike Errigo	SAFMC	Fishery Biologist
Mike Jepson	NMFS/SF	Fishery Social Scientist
Monica Smit-Brunello	NMFS SERO/GC	Attorney
Myra Brouwer	SAFMC	Fishery Biologist
Nick Farmer	NMFS/SF	Fishery Biologist
Jeff Radonski	NOAA/OLE	Special Agent
Rick DeVictor	NMFS/SF	Fishery Biologist
Roger Pugliese	SAFMC	Sr. Fishery Biologist
Scott Sandorf	NMFS/SF	Technical Writer & Editor
Stephen Holiman	NMFS/SF	Supervisory Industry Economist
Tony Lamberte	NMFS/SF	Economist

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

Chapter 8. List of Agencies, Organizations, and Persons to Whom Copies of the Statement are Sent

Responsible Agency

Regulatory Amendment 16:
South Atlantic Fishery Management Council
4055 Faber Place Drive, Suite 201
Charleston, South Carolina 29405
(843) 571-4366 (TEL)
Toll Free: 866-SAFMC-10
(843) 769-4520 (FAX)
safmc@safmc.net

Environmental Impact Statement:
NMFS, Southeast Region
263 13th Avenue South
St. Petersburg, Florida 33701
(727) 824-5301 (TEL)
(727) 824-5320 (FAX)

List of Agencies, Organizations, and Persons Consulted

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

Chapter 9. References

To Be Updated

Barco, S.G., W.A. McLellan, J. Allen, R. Asmutis, R. Mallon-Day, E. Meagher, D.A. Pabst, J. Robbins, R. Seton, R.M. Swingle, M.T. Weinrich, and P. Clapham, Population identity of humpback whales in the waters of the U.S. mid-Atlantic states, *J. Cetacean Res. Manage*. 4:135-141, 2002.

Barlow, J., and P.J. Clapham, A new birth-interval approach to demographic parameters of humpback whales, *Ecology*, 78:535-546, 1997.

Baumgartner, M.F. and B.R. Mate 2005. Summer and fall habitat of North Atlantic right whales (Eubalaena glacialis) inferred from satellite telemetry. Can. J. Fish. Aq. Sci. 62: 527-543

Best, P.B., J.L. Bannister, R.L. Brownell, Jr., and G.P. Donovan, (ed.), Report of the workshop on status and trends of western North Atlantic right whales. *J. Cetacean Res. Manage.* (Special Issue) 2:61-87, 2001.

Brown, M.W. and M.K. Marx 2000. Surveillance, monitoring and management of North Atlantic right whales, Eubalaena glacialis, in Cape Cod Bay, Massachusetts: January to Mid-May, 2000. Division of Marine Fisheries, Commonwealth of Massachusetts. final report

Cassoff, R.M., K.M. Moore. W.A. McLellan, S.G. Barco, D.S. Rotstein, and M.J. Moore. Lethal entanglement in baleen whales. Dis Aquat Org 96: 175−185, 2011.

Caswell, H., M. Fujiwara, and S. Brault. Declining survival probability threatens the North Atlantic right whale. *Proceedings of the National Academy of Science USA* 96: 3308-3313, 1999.

CETAP, A characterization of marine mammals and turtles in the mid- and north Atlantic areas of the USA outer continental shelf. Cetacean and Turtle Assessment Program, University of Rhode Island. Final Report #AA551-CT8-48 to the Bureau of Land Management, Washington, DC, 538 pp., 1982.

Clapham, P.J. and C.A. Mayo, Reproduction and recruitment of individually identified Humpback whales, *Megaptera novaeangliae*, observed in Massachusetts Bay, 1979-1985, *Can. J. Zool*. 65(12):2853-2863, 1987.

Clapham, P.J. and C.A. Mayo, Reproduction of humpback whales *(Megaptera novaeangliae)* observed in the Gulf of Maine, *Rep. Int. Whal. Commn.* Special Issue 12:171-175, 1990.

Clapham, P.J., Age at attainment of sexual maturity in humpback whales, *Megaptera novaeangliae, Can. J. Zool.*, 70:1470-1472, 1992.

Clapham, P.J., L.S. Baraff, C.A. Carlson, M.A. Christian, D.K. Mattila, C.A. Mayo, M.A. Murphy, and S. Pittman, Seasonal occurrence and annual return of humpback whales in the southern Gulf of Maine, *Can. J. Zool.* 71:440-443, 1993.

Clapham, P.J., and R.L. Brownell, Jr. Potential for interspecific competition in baleen whales. Report to International Whaling Commision 46:361-367, 1996.

Clapham, P.J., S.B. Young, and R.L. Brownell, Baleen whales: Conservation issues and the status of the most endangered populations, *Marine Mammal Rev.* 29(1):35-60, 1999.

Clapham, P.J., S. Brault, H. Caswell, M. Fujiwara, S. Kraus, R. Pace, and P. Wade. Report of the working group on survival estimation for North Atlantic right whales. September 27, 2002.

Clapham, P.J., J. Barlow, T. Cole, D. Mattila, R. Pace, D. Palka, J. Robbins, and R. Seton, Stock definition, abundance, and demographic parameters of humpback whales from the Gulf of Maine, *J. Cetacean Res. Manage*., 5:13-22, 2003.

Cole, T.V.N., D. Hartley and R.L. Merrick. Methodologies of the NOAA National Marine Fisheries Service aerial survey program for right whales (Eubalaena glacialis) in the Northeast U.S., 1998-2006. Northeast Fish. Sci. Cent. Ref. Doc. 05-08, 2005.

Durbin, E., G. Teegarden, R. Campbell, A. Cembella, M.F. Baumgartner, and B.R. Mate. North Atlantic right whales, *Eubalaena glacialis*, exposed to paralytic shellfish poisoning (PSP) toxins via a zooplankton vector, *Calanus finmarchicus*. *Harmful Algae* 1:243-251, 2002.

Frasier, T.R., B.A. McLeod, R.M. Gillett, M.W. Brown and B.N. White. Right Whales Past and Present as Revealed by Their Genes. Pp 200-231. *In*: S.D. Kraus and R.M. Rolland (eds) *The Urban Whale*. Harvard University Press, Cambridge, Massachusetts, London, England. vii-xv + 543pp, 2007.

Fujiwara, M. and H. Caswell, Demography of the endangered North Atlantic right whale, *Nature* 414:537-541, 2001.

Geraci, J.R., Clinical investigation of the 1987-88 mass mortality of bottlenose dolphins along the U.S. central and south Atlantic coast, Final Report to the National Marine Fisheries Service, U.S. Navy, Office of Naval Research, and Marine Mammal Commission, Washington, D.C., 1989.

Gowan, T.A. and J.G. Ortega-Ortiz. Wintering habitat model for the North Atlantic right whales (*Eubalaena glacialis)* in Southeastern United States. PLoS ONE: 9(4): e95126. 14 pgs. 2014.

Hain, J.H.W., G.R. Carter, S.D. Kraus, C.A. Mayo, and H.E. Winn, Feeding behavior of the humpback whale, *Megaptera novaeangliae*, in the western North Atlantic, Fish Bull., U.S. Fish. Wildl. Serv., 80:259-268, 1982.

Hamilton, P.K., M.K. Marx, and S.D. Kraus, Scarification analysis of North Atlantic right whales *(Eubalaena glacialis)* as a method of assessing human impacts. Final report to the Northeast Fisheries Science Center, NMFS, Contract No. 4EANF-6-0004, 1998.

Henry, A.G., T.V.N. Cole, M. Garron, L. Hall, W. Ledwell and A. Reid. 2012. Mortality and serious injury determinations for baleen whale stocks along the Gulf of Mexico, United States East Coast and Atlantic Canadian Provinces, 2006-2010, NEFSC Reference Document 12-11. 24 pp.

Greene, C.H., and A.J. Pershing. The flip-side of the North Atlantic Oscillation and modal shifts in slope water circulation patterns. *Limnology and Oceanography* 48: 319-322, 2003.

Good, C. Spatial ecology of the North Atlantic right whale (*Eubalaena glacialis*). Ph.D. Dissertation, Duke University, 2008. Available at: http://hdl.handle.net/10161/588.

International Whaling Commission. 2001. Report of the Workshop onthe Comprehensive Assessment of Right Whales: A worldwide comparison. J. Cetacean Res. Manage. (special issue) 2:1-60.

Jackson A., R. Inger, A.C. Parnell, S. Bearhop. Comparing isotopic niche widths among and within communities: SIBER – Stable Isotope Bayesian Ellipses in R. *J Anim Ecol* 80: 595–602, 2011. doi: 10.1111/j.1365-2656.2011.01806.x

Jackson, K. A., J. L. Jakush, T. D. Pitchford, and J. G. Ortega-Ortiz. 2012a. Aerial Surveys for Ship Strike Mitigation and Other Field Observations of North Atlantic Right Whales (*Eubalaena glacialis*) off the East Coast of Florida December 2011-March 2012 Southern Early Warning System. Final Report to NOAA Fisheries Service. Requisition Numbers NFFN53001000014 and NFFN53001100030.

Jackson, K. A., J. L. Jakush, and J. G. Ortega-Ortiz. 2012b. Aerial Surveys for Ship Strike Mitigation and Other Field Observations of North Atlantic Right Whales (*Eubalaena glacialis*) off the East Coast of Florida and Georgia December 2011-March 2012 Central Early Warning System. Final Report to NOAA Fisheries Service. Contract No. WC133F-10-CN-0348.

Johnson, A.J., G.S. Salvador, J.F. Kenney, J. Robbins, S.D. Kraus, S.C. Landry, and P.J. Clapham, Fishing gear involved in entanglements of right and humpback whales, *Marine Mammal Science* 21(4):635-645, 2005.

Katona, S.K., J.A. Beard, Population Size, Migrations, and Feeding Aggregations of the Humpback Whale *(Megaptera novaeangliae)* in the Western North Atlantic Ocean, *Reports of the International Whaling Commission,* Special Issue 12:295-306, 1990.

Keller, C.A., L.I. Ward-Geiger, W.B. Brooks, C.K. Slay, C.R. Taylor, and B.J. Zoodsma. North Atlantic right whale distribution in relation to sea-surface temperature in the southeastern United States calving grounds. *Marine Mammal Science* 22 (2): 426-445, 2006.

Keller, C.A., L. Garrison, R. Baumstark, L.I. Ward-Geiger, E. Hines. Application of a habitat model to define calving habitat of the North Atlantic right whale in the southeastern United States. Endangered Species Research 18: 73–87, 2012.

Kenney, R.D., North Atlantic, North Pacific, and Southern hemisphere right whales, pp. 806-813 in: W.F. Perrin, B. Wursig, and J.G.M. Thewissen (eds.), *Encyclopedia of Marine Mammals*. Academic Press, CA. 2002.

Knowlton, A.R. and S.D. Kraus. Mortality and serious injury of northern right whales *(Eubalaena glacialis)* in the western North Atlantic Ocean. *J. Cetacean Res. Manage.*, 2001.

Knowlton, A., Ring, J., and Russell, B. 2002. Right whale sightings and survey effort in the mid-atlantic region: migratory corridor, time frame, and proximity to port entrances. A report submitted to the NMFS Ship Strike Working Group. Available from www. nero.noaa.gov/shipstrike/ssr/midatanticreportrFINAL.pdf

Knowlton, A.R., M.K. Marx, H.M. Pettis, P.K. Hamilton and S.D. Kraus. Analysis of scarring on North Atlantic right whales (*Eubalaena glacialis*): monitoring rates of entanglement interaction 1980-2002. National Marine Fisheries Service. Contract#43EANF030107. Final Report. 2005.

Knowlton, A.R, PK Hamilton, MK Marx, HM Pettis, and SD Kraus. 2011. Final report on 2007/2008 right whale entanglement scar coding efforts. Final Report to National Marine Fisheries Service. New England Aquarium, Boston, MA.

Knowlton, A.R., P.K. Hamilton, M.K. Marx, H.M. Pettis, and S.D. Kraus. Monitoring North Atlantic right whale *Eubalaena glacialis* entanglement rates: a 30 year retrospective. *Marine Ecology Progress Series* 466: 293-302. 2012.

Kraus, S.D., M.J. Crone, and A.R. Knowlton. The North Atlantic right whale, in: W.E. Chandler (ed.), *The Audubon Wildlife Report 1988/1989*. Academic Press, N.Y. 1988.
Kraus, S.D., P.K. Hamilton, R.D. Kenney, A.R. Knowlton, and C.K. Slay. Reproductive parameters of the North Atlantic right whale. *J. Cetacean Res. Manage*. (Special Issue) 2:231-236. 2001.

Kraus, S.D., R.M. Pace III, and T.R. Frasier. High investment, low return: the strange case of reproduction in *Eubalaena glacialis*. *in* Kraus, S.D. and R. M. Rolland, Eds. The Urban Whale: North Atlantic Right Whales at the Crossroads. Harvard University Press. Cambridge, Massachusetts p172-199, 2007.

Learmonth J.A., C.D. MacLeod, M.B. Santos, G.J. Pierce, H.Q.P. Crick and R.A. Robinson. Potential effects of climate change on marine mammals. *Oceanography and Marine Biology: an Annual Review* 44, 431–464. 2006.

Lewis, C.N., K.A. Brown, L.A. Edwards, G. Cooper, and H.S. Findlay. Sensitivity to ocean acidification parallels natural pCO2 gradients experienced by Arctic copepods under winter sea ice. PNAS, 110, 2013. doi: 10.1038/NCLIMATE1599.
MacLeod, C.D. Global climate change, range changes and potential implications for the conservation of marine cetaceans: a review and synthesis. *End. Spec. Res*. 7: 125–136, 2009.

Malik, S., M.W. Brown, S.D. Kraus, and B.N. White. Analysis of DNA diversity within and between North and South Atlantic right whales, *Mar. Mammal Sci.* 16:545-558, 2000.
Mate, B.M., S.L. Nieukirk, and S.D. Kraus, Satellite-monitored movements of the North Atlantic right whale, *J. Wildl. Manage.*, 61:1393-1405, 1997.

McLellan, W.A., E. Meagher, L. Torres, G. Lovewell, C. Harper, K. Irish, B. Pike and A.D. Pabst 2004. Winter right whale sightings from aerial surveys of the coastal waters of the US mid-Atlantic. 15th Biennial Conference on the Biology of Marine Mammals

Miller, C.A., D. Reeb, P.B. Best, A.R. Knowlton, M.W. Brown and M.J. Moore. Blubber thickness in right whales *Eubalaena glacialis* and *Eubalaena australis* related with reproduction, life history status and prey abundance. *Marine Ecology*
Progress Series 438: 267-283, 2011.

Mitchell, E. 1975. Preliminary report on Nova Scotia fishery for sei whales (*Balaenoptera borealis*). Report to International Whaling Commission 25:218-225, 1975.

Moore, M.J, A.R. Knowlton, S.D. Kraus, W.A. McLellan, R.K. Bonde. 2004. Morphomentry, gross morphology and available histopathology in North Atlantic right whale (*Eubalaena glacialis*) mortalities (1970-2002). *J. Cetacean Res. Manage.* 6(3):199-214.

NMFS, Final recovery plan for the humpback whale (*Megaptera novaeangliae)*, Office of Protected Resources, November 1991b.

NMFS, A Message from the NOAA Assistant Administrator for Fisheries, NMFS's Report on the Status of the U.S. Fisheries for 2004, 2005. Available at: http://www.mafmc.org/midatlantic/StatusReport2004.pdf.

National Marine Fisheries Service (NMFS). 2006. Review of the Status of the Right Whales in the North Atlantic and North Pacific Oceans. National Marine Fisheries Service, Silver Spring, Md.

Pabst, D., C. Taylor, M. Zani, A. Glass, A. Knowlton, C. Khan, R. McAlarney, and W. McLellan. 2009. North Atlantic right whale (*Eubalaena glacialis*) sightings in the US mid-Atlantic and southeast Atlantic Bight (Virginia through South Carolina) from 2001-2008. 18th Biennial Conference on the Biology of Marine Mammals, Quebec City, Canada.

P J Palsboll, J Allen, M Berube, P J Clapham*, T P Feddersen, P S Hammond, R R Hudson, H Jorgensen, S Katona, A Larsen-Holm, F Larsen, J Lien, D K Mattila*, N Oien, J Sigurjonsson, R

Sears, T Smith, R Sponer, P Stevick. 1997. Genetic tagging of humpback whales Nature 388: 767-769.

Payne, P.M., J.R. Nicholas, L. O'Brien, and K.D. Powers. 1986., The Distribution of the Humpback Whale, *Megaptera novaeangliae*, on Georges Bank and in the Gulf of Maine in Relation to Densities of the Sand Eel, *Ammodytes americanus*, *Fish. Bull., U.S.* 84:271-277.

Payne, P.M., D.N. Wiley, S.B. Young, S. Pittman, P.J. Clapham, and J.W. Jossi. Recent fluctuations in the abundance of baleen whales in the southern Gulf of Maine, *Fish. Bull*. 88 (4):687-696, 1990.

Perruso, L. and Waters, J. 2005. Trip-level cost function estimation for the South Atlantic snapper-grouper commercial fishery. Working Paper Series SEFSC-SSRG-09. Southeast Fisheries Science Center, 75 Virginia Beach Dr., Miami, FL 33133.

Perry, S.L., D.P. DeMaster, and G.K. Silber, The great whales: and status of six species listed as endangered under the U.S. Endangered Species Act of 1973, *Mar. Fish. Rev.* Special Edition. 61(1):59-74, 1999.

Robbins, J. and D. Mattila. Monitoring entanglement scars on the caudal peduncle of Gulf of Maine humpback whales. Report to the National Marine Fisheries Service. Order No. 40EANF80028. 15 pp., 1999.

Robbins, J. Scar-based inference into the Gulf of Maine humpback whale entanglement: 2003-2006. Report to National Marine Fisheries Service, Northeast Fisheries Science Center, Woods Hole, MA. NOAA Contract #EA133F04SE0998. 2009.

Rolland, R.M., P.K. Hamilton, M.K Marx, H.M. Pettis, C.M. Angell, and M.J. Moore. External perspectives on right whale health. *in* Kraus, S.D. and R. M. Rolland, Eds. The Urban Whale: North Atlantic Right Whales at the Crossroads. Harvard University Press. Cambridge, Massachusetts p. 273-309, 2007.

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

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

SAFMC (South Atlantic Fishery Management Council). 2013. Regulatory Amendment 19 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with

Final Environmental Assessment, Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2014. Regulatory Amendment 14 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Assessment, Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

Schaeff, C.M., S.D. Kraus, M.W. Brown, J.S. Perkins, R. Payne, and B.N. White. Comparison of genetic variability of North and South Atlantic right whales *(Eubalaena)* using DNA fingerprinting, *Can. J. Zool.* 75:1073-1080, 1997.
Stevick, P., N. Oien and D.K. Mattila. Migration of a humpback whale between Norway and the West Indies. *Mar. Mammal Sci.* 14:162-166, 1998.

SERO (NMFS Southeast Regional Office). 2014. Evaluation of black sea bass trap gear closure alternatives in South Atlantic Snapper-Grouper Regulatory Amendment 16.

Stevick, P.T., J. Allen, P.J. Clapham, N. Friday, S.K. Katona, F. Larsen, J. Lien, D.K. Mattila, P.J. Palsbøll, R. Sears, J. Sigurjónsson, T.D. Smith, G. Vikingsson, J. Øien, and P.S. Hammond, Trends in abundance of North Atlantic humpback whales, 1979-1993, Paper SC/53/NAH2 presented to the International Whaling Commission Scientific Committee, Available from IWC, 135 Station Road, Impington, Cambridge, UK, 2001.

Swingle, W.M., S.G. Barco, T.D. Pitchford, W.A. McLellan, and D.A. Pabst, Appearance of juvenile humpback whales feeding in the nearshore waters of Virginia, *Mar. Mamm. Sci.* 9:309-315, 1993.

Taylor, J., M. Zani, A. Knowlton, B Wikgren, P. Hamilton, S. Kraus. 2010. Aerial surveys to reduce ship/whale collisions in the calving ground of the North Atlantic right whale (*Eubalaena glacialis*). NMFS, Fernandina Beach, Florida.
van der Hoop, J. M., A. S. M. Vanderlaan, and C. T. Taggart. Absolute probability of lethal vessel strikes to North Atlantic right whales in Roseway Basin, Scotian Shelf. Ecological Applications 22:2021–2033, 2012.

van der Hoop, J. M., M. J. Moore, S. G. Barco, T. V. Cole, P. Y. Daoust, A. G. Henry, D. F. McAlpine, W. A. McLellan, T. Wimmer and A. R. Solow. 2013. Assessment of management to mitigate anthropogenic effects on large whales. Conservation Biology 27:121-133, 2013.

Wade, P.R., and R.P. Angliss, Guidelines for assessing marine mammal stocks: Report of the GAMMS Workshop, April 3-5, 1996, Seattle, Washington. NOAA Technical Memorandum NMFS-OPR-12. U.S. Dept. of Commerce, Washington, DC. 93 pp., 1997.

Waring, G.T., E. Josephson, C.P. Fairfield, and K. Maze-Foley (eds.), U.S. Atlantic and Gulf of Mexico marine mammal stock assessments – 2005, NOAA Technical Memorandum

NOAA-NE-194, 2006.

Waring GT, Josephson E, Maze-Foley K, Rosel, PE, editors. 2012. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments -- 2011. NOAA Tech Memo NMFS NE 221; 319 p.

Waring GT, Josephson E, Maze-Foley K, Rosel, PE, editors. 2013. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments -- 2012. NOAA Tech Memo NMFS NE 223; 419 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026, or online at http://www.nefsc.noaa.gov/nefsc/publications/

Weinrich, M.T., M.R. Schilling, and C.R. Belt, Evidence of acquisition of a novel feeding behaviour: lobtail feeding in humpback whales, *Megaptera novaeangliae*, *Anim. Behav.*, 44:1059-1072, 1992.

Weisbrod, A.V., D. Shea, M.J. Moore, and J.J. Stegeman, Organochlorine exposure and bioaccumulation in the endangered Northwest Atlantic right whale *(Eubalaena glacialis)* population, *Environmental Toxicology and Chemistry*, 19(3):654-666, 2000.

Wiley, D.N., R.A. Asmutis, T.D. Pitchford, and D.P. Gannon, Stranding and mortality of humpback whales, *Megaptera novaeangliae*, in the Mid-Atlantic and southeast United States, 1985-1992, *Fish. Bull.*, U.S. 93:196-205, 1995.

Wise, J.P., S.S. Wise, S. Kraus, F. Shaffiey, M. Grau, T.L. Chen, C. Perkins, W.D. Thompson, T.

Zheng, Y. Zhang, T. Romano, and T. O'Hara. Hexavalent chromium is cytotoxic and genotoxic to the North Atlantic right whale (Eubalaena glacialis) lung and testes fibroblasts. *Mutat Res* 650: 30-38, 2008.

Wynne, K. and M. Schwartz, Guide to marine mammals and turtles of the U.S. Atlantic and Gulf of Mexico, Rhode Island Sea Grant, Narragansett, 115 pp., 1999.

Akaike, H. 1974. A new look at the statistical model identification. IEEE Transactions on Automatic Control, 19(6):716–723.

Brown, M.W. and M.K. Marx. 2000. Surveillance, monitoring and management of North Atlantic right whales, *Eubalaena glacialis*, in Cape Cod Bay, Massachusetts: January to Mid-May, 2000. Division of Marine Fisheries, Commonwealth of Massachusetts. Final Report.

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

Carter, D. pers. comm., 2009. Response to the 7/10/09 Data Request for Amendment 17A to the Snapper Grouper Fishery Management Plans of the South Atlantic.

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

CeTAP. 1982. A characterization of marine mammals and turtles in the mid- and north Atlantic areas of the U.S. outer continental shelf. Cetacean and Turtle Assessment Program, University of Rhode Island. Final Report #AA551-CT8-48 to the Bureau of Land Management, Washington, DC, 538 pp.

Clapham, P.J. 2002. Humpback Whales (*Megaptera novaeangliae*). Pp 589-592. In: W.F. Perrin, B. Würsig, and J.G.M Thewissen (eds) Encyclopedia of Marine Mammals. Academic Press, San Diego, San Francisco, New York, Boston, London, Sydney, Tokyo. 1414 pp.

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

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

Garrison, L.P. 2007. The Big Picture: Modeling Right Whales in Space and Time. In: The Urban Whale, Krauss, S.K. and Rolland, R. (eds.). Harvard University Press. Pgs 460-488.

Glass A.H., T.V.N Cole, and M. Garron. 2009. Mortality and serious injury determinations for baleen whale stocks along the United States eastern seaboard and adjacent Canadian Maritimes, 2003-2007 (2nd Edition). U.S. Dep. of Commerce, Northeast Fisheries Science Center. Ref Doc. 09-04; 19 p.

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

Holland, S., A. Fedler and J.W. Milon. 1999. The operations and economics of the charter and head boat fleets of the eastern Gulf of Mexico and South Atlantic coasts. Technical Report for U.S. Department of Commerce: National Marine Fisheries Service. St. Petersburg, Florida.

Holland, S., C. Oh, S.L. Larkin, and A.W. Hodges. 2012. The Operations and Economics of the For-Hire Fishing Fleets of the South Atlantic States and the Atlantic Coast of Florida. Final

report prepared for the National Marine Fisheries Service, Marine Fisheries Initiative (MARFIN) Program Grant Number NA09NMF4330151.

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

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

Johnson, A., G. Salvador, J. Kenney, J. Robbins, S. Kraus, S. Landry, and P. Clapham. 2005. Fishing Gear Involved in Entanglements of Right and Humpback Whales. Marine Mammal Science, 21(4):635–645.

Keller, C.A., L. Garrison, R. Baumstark, L.I. Ward-Geiger, and E. Hines. 2012. Application of a habitat model to define calving habitat in the North Atlantic right whale in the southeastern United States. Endangered Species Research 18:73-87.

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

Kenney, R.D. 2002. North Atlantic, North Pacific and Southern Right Whales. pp. 806-813, In: W.F. Perrin, B. Würsig, and J.G.M. Thewissen (eds.). Encyclopedia of Marine Mammals. Academic Press, San Diego, CA.

Knowlton, A.R., L. A. Cooper, P. K. Hamilton, M. K. Marx, H. M. Pettis, and S. D. Kraus. 2008. Analysis of scarring on North Atlantic right whales (*Eubalaena glacialis*): Monitoring rate of entanglement interaction 1980 – 2004. Final report to the Northeast Fisheries Science Center, NMFS, Contract No. EA133F-03-SE-0323. New England Aquarium: 25pp.

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

MacIntyre, I. G. and J. D. Milliman. 1970. Physiographic features on the outer shelf and upper slope, Atlantic Continental Margin, southeastern United States. Geological Society of America Bulletin 81:2577-2598.

McGovern, J.C., M. R. Collins, O. Pashuk, and H.S. Meister. 2002. Changes in the life history of black sea bass, *Centropristis striata*, from the southeastern United States during 1978-1998. North American Journal of Fisheries Management Vol. 22, No. 4, pp. 1151–1163.

Miller, G. C. and W. J. Richards. 1979. Reef fish habitat, faunal assemblages and factors determining distributions in the South Atlantic Bight. Proceedings of the Gulf and Caribbean

Fisheries Institute 32:114-130.

Newton J.G., O.H. Pilkey, and J.O. Blanton. 1971. An Oceanographic Atlas of the Carolina and continental margin. North Carolina Dept. of Conservation and Development. 57 p.

NMFS. 2014. Evaluation of black sea bass trap gear closure alternatives in South Atlantic Snapper-Grouper Regulatory Amendment 16.

NOAA SEFSC SSRG. 2009. Economic Value of Catch and Keep in the Southeastern U.S.: Evidence from a Choice Experiment.

Pabst, D.A., C. Taylor, M. Zani, A. Glass, A. Knowlton, C. Khan, R.J. McAlarney, and W.A. McLellan. 2009. North Atlantic right whale (*Eubalaena glacialis*) sightings in the US mid-Atlantic and southeast Atlantic Bight (Virginia through South Carolina) from 2001-2008. 18th Biennial Conference on the Biology of Marine Mammals, Quebec City, Canada.

Parker, R.O., D.R. Colby, and T.D. Willis. 1 1983. Estimated amount of reef habitat on a portion of the U.S. South Atlantic and Gulf of Mexico Continental Shelf. Bulletin of Marine Science 33: 935-940.

Perry, S.L., D.P. DeMaster, and G.K. Silber. 1999. The great whales: History and status of six species listed as endangered under the U.S. Endangered Species Act of 1973. Mar. Fish. Rev. Special Edition. 61(1): 59-74.

Perruso, L. and Waters, J. 2005. Trip-level cost function estimation for the South Atlantic snapper-grouper commercial fishery. Working Paper Series SEFSC-SSRG-09. Southeast Fisheries Science Center, 75 Virginia Beach Dr., Miami, FL 33133.

Robbins, J. and D. Mattila. 2004. Estimating humpback whale (*Megaptera novaeangliae*) entanglement rates on the basis of scar evidence: Report to the Northeast Fisheries Science Center, National Marine Fisheries Service. Order number 43EANF030121. 21 p.

Robins, C.R. and G.C. Ray. 1986. A field guide to Atlantic coast fishes of North America. Houghton Mifflin Company, Boston, U.S.A. 354 p.

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

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

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

SAFMC (South Atlantic Fishery Management Council). 1991. Amendment Number 4, Regulatory Impact Review, Initial Regulatory Flexibility Analysis and Environmental Assessment for the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Cir., Suite 306, Charleston, S.C. 29407-4699. 200 pp.

SAFMC (South Atlantic Fishery Management Council). 1993. Amendment Number 6, Regulatory Impact Review, Initial Regulatory Flexibility Analysis and Environmental Assessment for the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Cir., Suite 306, Charleston, S.C. 29407-4699. 155 pp.

SAFMC (South Atlantic Fishery Management Council). 1998. Amendment 9, Final Supplemental Environmental Impact Statement, Initial Regulatory Flexibility Analysis/Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement for the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Cir., Suite 306, Charleston, S.C. 29407-4699. 246 pp.

SAFMC (South Atlantic Fishery Management Council). 2006. Amendment 13C, Final Environmental Assessment, Initial Regulatory Flexibility Analysis/Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement for the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Cir., Ste 306, Charleston, S.C. 29407-4699. 631 pp.

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

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

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

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

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

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

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

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

SAFMC (South Atlantic Fishery Management Council). 2011b. Regulatory Amendment 11 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2011c. Comprehensive Annual Catch Limit (ACL) Amendment. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2011d. Amendment 24 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2012a. Amendment 18A to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2012b. Amendment 18B to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2013a. Regulatory Amendment 13 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2013b. Regulatory Amendment 18 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2013c. Regulatory Amendment 19 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Assessment, Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2014. Amendment 18A to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Assessment, Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SEDAR 25. 2011. Stock Assessment Report. South Atlantic Black Sea Bass. Available from the SEDAR website: www.sefsc.noaa.gov/sedar/

SEDAR 25 Update. 2013. Stock Assessment Report. South Atlantic Black Sea Bass. Available from the SEDAR website: www.sefsc.noaa.gov/sedar/

Sedberry, G.R. 1988. Food and feeding of black sea bass, *Centropristis striata*, in live bottom habitats in the South Atlantic Bight. J. Elisha Mitchell Sci. Soc. 104(2):35-50.

SERO-LAPP-2012-04. South Atlantic Black Sea Bass Annual Catch Limit Closure Projection – 2012/13 Fishing Year Southeast Regional Office. NOAA Fisheries Service. Southeast Regional Office. St. Petersburg, Florida. May 14, 2012.

Stevick, P.T., J. Allen, P.J. Clapham, S.K. Katona, F. Larsen, J. Lien, D.K. Mattila, P.J. Palsboll, R. Sears, J. Sigurjonsson, T.D. Smith, G. Vikingsson, N. Oien, P.S. Hammond. 2006. Population spatial structuring on the feeding grounds in North Atlantic humpback whales (*Megaptera novaeangliae*). Journal of Zoology. 270(2006) 244-255.

Sutton, S.G., R.B. Ditton, J.R. Stoll, and J.W. Milon. 1999. A cross-sectional study and longitudinal perspective on the social and economic characteristics of the charter and party boat fishing industry of Alabama, Mississippi, Louisiana, and Texas. Report prepared for the National Marine Fisheries Service.

Swingle, W.M., S.G. Barco, T.D. Pitchford, W.A. McLellan, and D.A. Pabst. 1993. Appearance of juvenile humpback whales feeding in the nearshore waters of Virginia. Marine Mammal Science, 9:309-315.

Vaughan, D.S., M.R. Collins, and D.J. Schmidt. 1995. Population characteristics of the U.S. South Atlantic black sea bass *Centropristis striata*. Bulletin of Marine Science 56:250-267.

Waring, G.T., E. Josephson, K. Maze-Foley, and P.E. Rosel (eds). 2009. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments-2009. NOAA Tech Memo NMFS NE 213; 528 p.

Waring, G.T., E. Josephson, K. Maze-Foley, and P.E. Rosel, (eds). 2013. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments, Volume 1 – 2012. U.S. Department of Commerce, Woods Hole, MA. NOAA Technical Memorandum, 419 pp. http://www.nmfs.noaa.gov/pr/sars/pdf/ao2012.pdf

Wenner, C.A., W.A. Roumillat, and C.W. Waltz. 1986. Contributions to the life history of black sea bass, *Centropristis striata*, off the Southeastern United States. Fishery Bulletin 84: 723-741.

Wiley, D.N., R.A. Asmutis, T.D. Pitchford, and D.P. Gannon. 1995. Stranding and mortality of humpback whales, *Megaptera novaeangliae*, in the Mid-Atlantic and southeast United States, 1985-1992. Fishery Bulletin 93(1): 196-205.

Chapter 10. Index

To Be Completed