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 Final Environmental Impact Statement

February 2016

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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 Atlantic Snapper Grouper Fishery of the South Atlantic Region

Including a Draft Environmental Impact Statement (EIS)

Abstract: This Final EIS is prepared pursuant to the National Environmental Policy Act to assess the environmental impacts associated with a regulatory action. The Draft EIS analyzes the impacts of a reasonable range of alternatives intended to evaluate modifying the annual November 1 through April 30 prohibition on the use of black sea bass pot gear and enhance current gear marking requirements for black sea bass pots.

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Summary

Background

A 2003 stock assessment concluded that black sea bass were overfished and undergoing overfishing. In response to the stock assessment and to end overfishing, the allowable harvest of black sea bass was reduced beginning in 2006, and the fishing year was changed from January 1 through December 31 to June 1 through May 31. To reduce overcapacity, measures were implemented in 2012 to limit participation through a black sea bass endorsement program and restrict the number of pots that could be fished. 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 South Atlantic Fishery Management Council's (Council) Scientific and Statistical Committee, 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 the National Marine Fisheries Service (NMFS,) through Regulatory Amendment 19 (Regulatory Amendment 19) to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP) (SAFMC 2013b), modified the ABC, ACLs, recreational annual catch target, and optimum yield for the black sea bass stock.

November 1 through April 30 is when endangered whales are present in the South Atlantic. Prior to the increase to the commercial ACL, the pot sector had not fished later than November 1 since the 2009/2010 season, because the smaller ACL was always harvested by that time. Modeling by NMFS indicated the increased commercial ACL, implemented via Regulatory Amendment 19, would have likely extended fishing activity with black sea bass pot gear past November 1. There is a potential for black sea bass pot gear to entangle endangered large whales. The possibility that pots might be fished past November 1, resulted in the Council and NMFS implementing a prohibition on the use of black sea bass pot gear from November 1 through April 30 each year, beginning in 2013. This allowed the ACL increase to be implemented quickly, while protecting the endangered whales. Additionally, in December 2014, Regulatory Amendment 14 to the Snapper Grouper FMP (Regulatory Amendment 14) changed the commercial black sea bass fishing year back to January 1 through December 31 each year. The change of the fishing year also increased the chances black sea bass pots would be in the water when Endangered Species Act (ESA)-listed whales, particularly North Atlantic right whales, are migrating through and calving in the South Atlantic.

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 would have been necessary under the ESA prior to the implementation of Regulatory Amendment 19. Formal ESA consultation would have

required development of a biological opinion to evaluate the effects of the snapper grouper fishery including 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 beginning of 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 potential entanglements with ESA-listed whales until a comprehensive Environmental Impact Statement and Biological Opinion could be completed.

Through Regulatory Amendment 16 to the Snapper Grouper FMP (Regulatory Amendment 16), the Council and NMFS are considering adjustments to both the geographical and temporal boundaries of the November 1 through April 30 prohibition to improve socio-economic benefits to black sea bass pot endorsement holders while maintaining protection for 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 during winter months making them easier to harvest. Fishermen have also reported that black sea bass tend to be a lot darker during winter months, which commands a higher price on the market.

History of Management of the Black Sea Bass Pot Sector

The black sea bass portion of the snapper grouper fishery has been managed under the Snapper Grouper FMP since the plan was first established in 1983. **Table S-1** shows the actions implemented from 1983 through 2013 that have affected the black sea bass pot sector.

Table S-1. History of Council management of the black sea bass commercial pot sector.

Date	Document	Action
8/31/83	Original FMP	8 inch total length minimum size limit
1/1/92	Amendment 1	Prohibited 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
11/30/92	Emergency Rule Extension	Modified definition of black sea bass pots Allowed multigear trips for black sea bass Retention of bycatch in the black sea bass fishery
7/6/93	Regulatory Amendment 4	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 inch total length minimum size limit Required escape vents and degradable fasteners
12/2/99	Amendment 11	Set overfished level at 3.72 million pounds
10/23/06	Amendment 13C	Established a commercial quota in 2006 and stepped it down in from 477,000 pounds gutted weight (lbs gw) in 2006 to 309,000 lbs gw in 2008 Required 2 inch mesh in back panel of pots Changed fishing year to June through May
12/30/10	Amendment 17B	Specified a commercial ACL of 309,000 lbs gw and recreational ACL of 409,000 lbs gw.
7/1/12	Amendment 18A	Reduced participation in the pot sector with 32 endorsements Established 1,000 lbs gw (1,180 pounds whole weight [lbs ww)] commercial trip limit Specified a maximum of 35 pots per vessel Increased minimum size limit to 11inches inches total length Required that pots be brought to shore at the conclusion of a trip
9/23/13 10/23/13	Reg Amend 19 Reg Amend 19	Increased 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 Specified hook and line trip limit of 300 lbs gw November 1 - April 30

The Black Sea Bass Pot Sector Since the 2006 Biological Opinion

In 2006, the final rule for Amendment 13C to the Snapper Grouper FMP (Amendment 13C) established a commercial quota for black sea bass, which greatly restricted commercial harvest of black sea bass, the majority of which was taken in the pot sector. Two additional amendments, Amendment 18A to the Snapper Grouper FMP (SAFMC 2012) and Regulatory Amendment 19 (SAFMC 2013b) further affected commercial fishing for black sea bass, but in very different ways.

Amendment 18A saw the implementation of endorsements, which are now needed to harvest black sea bass with pots. 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 commercial harvest of black sea bass. Fishermen with black sea bass pot endorsements were limited to no more than 35 pots per vessel. Previous to the implementation of Amendment 18A some fishermen were deploying as many as 150 pots. Leaving black sea bass pots to soak unattended was prohibited, as the final rule for Amendment 18A required pots to be brought back to shore at the end of each trip. The minimum 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 to 780,020 lbs ww in response to a stock assessment that indicated that black sea bass were no longer overfished and were rebuilt. Because of the limitations put into place in Amendment 18A and the increase in the commercial ACL, the length of the commercial black sea bass pot fishing season was expected to last much longer than it had in recent years.

All of these changes, taken together with those proposed in Regulatory Amendment 16, make it difficult to predict how fishery participants would modify their behavior, and in turn, the economic effects of proposed measures. Because of this uncertainty, multiple scenarios must be considered, where appropriate, when estimating economic effects of potential management changes.

Regulatory Amendment 16 considers alternatives to allow pot fishing during all, or part, of the November 1 through April 30 closed season, in some areas. Selection of any alternative other than **Alternative 1 (No Action)** for **Action 1**, is expected to result in development of a new ESA Biological Opinion (BiOp) for the snapper grouper fishery.

As discussed above, Amendment 18A and Regulatory Amendment 19, as well as other factors such as the general downturn in the economy, greatly changed how the black sea bass pot portion of the snapper grouper fishery operates since the 2006 BiOp was published. The 2006 BiOp evaluated the impacts to ESA-listed species, following the Council's development of Snapper Grouper Amendment 13C. The 2006 BiOp assessed potential impacts from the snapper grouper fishery, including management actions for the harvest of snowy grouper, golden tilefish, vermilion snapper, red porgy, and black sea bass.

Table S-2 shows a few of the characteristics of the black sea bass pot sector. Since the 2006 BiOp went into effect on June 7th of that year, the characteristics for 2006 are split for pre and post 2006 BiOp. While trips and pounds landed are additive for 2006, the number of vessels targeting black sea bass with pots are not additive because many of the vessels that caught black sea bass with pots in the first part of the fishing year also caught black sea bass in the second part of the fishing year.

Since the 2006 BiOp, the average annual number of vessels participating in the black sea bass pot portion of the snapper grouper fishery has been reduced from 54 to 42 (22%) and the average number of trips has been reduced from 822 to 412 (50%). The changes were due largely to Amendment 13C, which established a commercial quota for black sea bass.

Table S-2. Black sea bass pot sector characteristics, 2002 through 2014.

	Year (June 1st through May 31st)	Vessels	Trips	Landings (lb gw)
Pre-2006 BiOp	1996-1997	86	1276	609,424
	1997-1998	77	1258	525,920
	1998-1999	70	1277	633,987
	1999-2000	64	808	344,906
	2000-2001	61	903	430,008
	2001-2002	58	1082	423,902
	2002-2003	48	693	308,005
	2003-2004	52	878	591,403
	2004-2005	47	732	458,264
	2005-2006	47	658	298,782
	2006-2007	55	739	409,162
Post-2006 BiOp	2007-2008	49	556	279,888
	2008-2009	56	562	346,765
	2009-2010	41	434	288,059
	2010-2011	52	406	345,118
	2011-2012	40	235	260,464
	2012-2013	26	322	213,509
	2013-2014	27	366	223,633
Averages	1999-2006	54	822	407,896
	2007-2014	42	412	279,634

Source: SEFSC Logbook data (Apr 2015)

Note: Landings from 2006 are excluded from Averages calculated for both Pre and Post 2006 Biological Opinion. Also, the landings in the year column are from June 1st through May 31st in order to retain a consistent time series for comparison purposes. Please note that the black sea bass fishing years for the commercial and recreational sectors prior to October 23, 2006, began on January 1st. On that date, the fishing years were changed to begin June 1st. On December 8, 2014, the fishing years were changed to begin on January 1st and April 1st for the commercial and recreational sectors, respectively.

Purpose for Action

The purpose of Regulatory Amendment 16 is to reevaluate the annual November 1 through April 30 prohibition on the use of black sea bass pot gear, and enhance 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 reduce the adverse socioeconomic impacts resulting from the annual November 1 through April 30 prohibition on the use of black sea bass pot gear and increase the flexibility of black sea bass pot endorsement holders to fish with this gear while continuing to protect ESA-listed whales in the South Atlantic region; and reduce the adverse effects on whales if entangled and help identify black sea bass pot lines used in the South Atlantic.

Proposed Actions

Note: All tables and figures for the alternatives are in Chapter 2 of the regulatory amendment.

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

There are many alternatives and sub-alternatives under **Action 1**. The Council's intent is to modify the current prohibition to allow the entire commercial black sea bass portion of the snapper grouper fishery (all gear) to open beginning January 1 each year and have it last as long as possible before reaching the ACL and closing prior to December 31. The Council is also factoring in the need to protect critically endangered North Atlantic Right Whales (NARW) that migrate through South Atlantic waters and calve in the South Atlantic roughly during the November through April time-frame. To meet these two objectives, the Council is considering various time frames, water depths, and locations for allowing or not allowing black sea bass pot gear to be in the waters managed by the Council, so as to reduce, as much as possible, the potential for interactions between NARWs and black sea bass pot gear. Each of the alternatives and sub-alternatives of **Action 1** manipulate timing and location/depth of prohibited fishing areas to maximize fishing opportunity and protection for whales.

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 where black sea bass is managed in the South Atlantic exclusive economic zone (EEZ) (south of Cape Hatteras, North Carolina).

The following provisions currently exist that may reduce entanglements of black sea bass pot gear and 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 Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (SAFMC 2012):

- 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; and
- Established a commercial trip limit of 1,000 lbs gw.

See **Tables 1.8.1** through **1.8.5** in Regulatory Amendment 16 for measures mandated through the Atlantic Large Whale Take Reduction Plan.

A transit provision is needed to allow vessels to transit through areas closed to sea bass pots. Having a transit provision would keep vessels with black sea bass pots onboard from having to transit north or south of the closed area to get to their fishing grounds. Not having a transit provision would be a hardship that would force some vessels to travel hundreds of miles. This provision applies to all **Alternatives** and **Sub-alternatives 2** through **12** for Action 1. Sea bass pots must be removed from the water in the applicable closed area within the EEZ before the applicable time period, and may not be onboard a vessel in the closed area within the South Atlantic EEZ during the applicable closure, except for such sea bass pot gear appropriately stowed onboard a vessel in transit through the closed area. Transit means non-stop progression through the area; fishing gear appropriately stowed means all black sea bass pot gear must be out of the water and on board the deck of the vessel. All buoys must either be disconnected from the gear or stowed within the sea bass pot. Disconnected buoys may remain on deck.

Alternative 2. The black sea bass pot closure applies to the area currently designated as North Atlantic right whale critical habitat **(Figure 2.1.2)**. 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.

This area represents North Atlantic right whale critical habitat in the South Atlantic region designated on June 3, 1994. **Figure 2.1.2** provides location of the critical habitat boundary. The critical habitat designation did not provide waypoints for the boundary. The boundary and area in **Alternative 2** would not automatically change if the boundary for the right whale critical habitat were to change. On January 26, 2016, NMFS issued a final rule that created an expansion of the critical habitat area. The South Atlantic Council voted in December 2015 to send this amendment in for U.S. Secretary of Commerce review prior to the publication of the final rule for the North Atlantic right whale critical habitat area expansion.

The following is language describing the North Atlantic right whale critical habitat area from 50 CFR § 226.203(c) used to develop **Alternative 2**:

> *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.*

The following is language describing the North Atlantic right whale critical habitat area from 50 CFR § 226.203(c) as designated on January 26, 2016:

> *Southeastern United States: Includes marine waters from Cape Fear, North Carolina, southward to 28°N latitude (approximately 31 miles south of Cape Canaveral, Florida) within the area bounded on the west by the shoreline and the 72 COLREGS lines, and on the east by rhumb lines connecting the following points in the order stated from north to south.*

N. Latitude	**W. Longitude**
33°51’ N	at shoreline
33°42’ N	77°43’ W
33°37’ N	77°47’ W
33°28’ N	78°33’ W
32°59’ N	78°50’ W
32°17’ N	79°53’ W
31°31’ N	80°33’ W
30°43’ N	80°49’ W
30°30’ N	81°01’ W
29°45’ N	81°01’ W
29°15’ N	80º55’ W
29°08’ N	80°51’ W
28°50’ N	80°39’ W
28°38’ N	80°30’ W
28°28’ N	80°26’ W
28°24’ N	80°27’ W
28°21’ N	80°31’ W
28°16’ N	80°31’ W
28°11’ N	80°33’ W
28°00’ N	80º29’ W
28°00’ N	At shoreline

Note: Federal regulations for **Alternative 2** would only apply to that portion of the area within the South Atlantic EEZ. The states would be asked to implement consistent regulations within state waters.

Alternative 3. The black sea bass pot closure applies to waters inshore of points 1-15 listed in **Table 2.1.1**; approximately Ponce Inlet, Florida, to Cape Hatteras, North Carolina **(Figure 2.1.3)**. The closure applies to the area annually from November 1 through April 30.

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.

Note: Federal regulations for **Alternative 3** would only apply to that portion of the area within the South Atlantic EEZ. The states would be asked to implement consistent regulations within state waters.

Alternative 4. The black sea bass pot closure applies to waters inshore of points 1-28 listed in **Table 2.1.2**; approximately Cape Canaveral, Florida, to Cape Hatteras, North Carolina **(Figure 2.1.4)**. The closure applies to the area annually from November 1 through April 30.

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. **Figure 2.1.4** provides an approximate location of the proposed boundary.

Note: Federal regulations for **Alternative 4** would only apply to that portion of the area within the South Atlantic EEZ. The states would be asked to implement consistent regulations within state waters.

Alternative 5. The black sea bass pot closure applies to waters inshore of points 1-28 listed in **Table 2.1.3**; approximately Daytona Beach, Florida, to Cape Hatteras, North Carolina **(Figure 2.1.5)**. The closure applies to the area annually from November 1 through April 30.

This area is based on joint comments received from non-government organizations (dated January 3, 2014) in response to NMFS's December 4, 2013, *Federal Register* Notice of Intent to Prepare a 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 start of the EEZ to 30 nautical miles offshore. **Figure 2.1.5** provides an approximate location of the proposed boundary.

Note: Federal regulations for **Alternative 5** would only apply to that portion of the area within the South Atlantic EEZ. The states would be asked to implement consistent regulations within state waters.

Alternative 6. The black sea bass pot closure applies to waters inshore of points 1-20 listed in **Table 2.1.4**; approximately Sebastian, Florida, to Cape Hatteras, North Carolina **(Figure 2.1.6)**. The closure applies to the area annually from November 1 through April 30.

This area is also based on joint comments received from a number of environmental groups (dated January 3, 2014) in response to NMFS's December 4, 2013, *Federal Register* Notice of Intent to Prepare a 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 (ALWTRP); and an additional area off North Carolina. The area off North Carolina includes waters shallower than 30 m and is northward of the designated ALWTRP Southeast Restricted Area.

Note: Federal regulations for **Alternative 6** would only apply to that portion of the area within the South Atlantic EEZ. The states would be asked to implement consistent regulations within state waters.

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 in **Table 2.1.5**; approximately North of the Altamaha River, Georgia, to Cape Hatteras, North Carolina **(Figure 2.1.7)**.

> **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.

This area represents existing North Atlantic right whale critical habitat in the South Atlantic region designated on June 3, 1994. North Atlantic right whale critical habitat is currently undergoing a revision based on more current data. On January 26, 2016, NMFS issued a final rule that created an expansion of the critical habitat area. The South Atlantic Council voted in December 2015 to send this amendment in for U.S. Secretary

of Commerce review prior to the publication of the final rule for the North Atlantic right whale critical habitat area expansion. Off North Carolina and South Carolina, the black sea bass pot closure applies in the exclusive economic zone in waters shallower than 25 m. 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 (North Carolina/South Carolina) to the northeastern corner waypoint of the southern section (Florida/Georgia).

The following is language describing the North Atlantic right whale critical habitat area from 50 CFR § 226.203(c) as designated on January 26, 2016:

> *Southeastern United States: Includes marine waters from Cape Fear, North Carolina, southward to 28°N latitude (approximately 31 miles south of Cape Canaveral, Florida) within the area bounded on the west by the shoreline and the 72 COLREGS lines, and on the east by rhumb lines connecting the following points in the order stated from north to south.*

Latitude	**Longitude**
33°51’ N	at shoreline
33°42’ N	77°43’ W
33°37’ N	77°47’ W
33°28’ N	78°33’ W
32°59’ N	78°50’ W
32°17’ N	79°53’ W
31°31’ N	80°33’ W
30°43’ N	80°49’ W
30°30’ N	81°01’ W
29°45’ N	81°01’ W
29°15’ N	80º55’ W
29°08’ N	80°51’ W
28°50’ N	80°39’ W
28°38’ N	80°30’ W
28°28’ N	80°26’ W
28°24’ N	80°27’ W
28°21’ N	80°31’ W
28°16’ N	80°31’ W
28°11’ N	80°33’ W
28°00’ N	80º29’ W
28°00’ N	At shoreline

Note: Federal regulations for **Alternative 7** would only apply to that portion of the area within the South Atlantic EEZ. The states would be asked to implement consistent regulations within state waters.

Alternative 8. The black sea bass pot closure applies to waters inshore of points 1-35 listed in **Table 2.1.6**; approximately Daytona Beach, Florida, to Cape Hatteras, North Carolina **(Figure 2.1.8)**.

> **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.

In **Alternative 8**, the boundaries off Florida and Georgia are nearly 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.

Note: Federal regulations for **Alternative 8** would only apply to that portion of the area within the South Atlantic EEZ. The states would be asked to implement consistent regulations within state waters.

Alternative 9. The black sea bass pot closure applies to waters inshore of points 1-28 listed in **Table 2.1.7**; approximately Daytona Beach, Florida, to Cape Hatteras, North Carolina **(Figure 2.1.9)**.

> **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.

In **Alternative 9**, the boundaries off Florida and Georgia are nearly 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.

Note: Federal regulations for **Alternative 9** would only apply to that portion of the area within the South Atlantic EEZ. The states would be asked to implement consistent regulations within state waters.

Alternative 10. From November 1 through December 15, the black sea bass pot closure applies to waters inshore of points 1-20 listed in **Table 2.1.8**; approximately Georgia/South Carolina State Line, to Cape Hatteras, North Carolina **(Figure 2.1.10).**

From February 15 through April 30, the black sea bass pot closure applies to waters inshore of points 1-28 listed in **Table 2.1.9**; approximately Georgia/South Carolina State Line, to Cape Hatteras, North Carolina **(Figure 2.1.11).**

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 in **Table 2.1.8**; approximately Georgia/South Carolina State Line, to approximately Daytona Beach, Florida **(Figure 2.1.10).**

Note: In **Alternative 10**, the boundaries off Florida and Georgia are nearly 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 m from November 1 through December 15 and 25 m from February 15 through April 30.

Note: Federal regulations for **Alternative 10** would only apply to that portion of the area within the South Atlantic EEZ. The states would be asked to implement consistent regulations within state waters.

Preferred Alternative 11. From November 1 through 30 and from April 1 through 30 each year, the black sea bass pot closure applies to waters inshore of points 1-35 listed in **Table 2.1.10**; approximately Daytona Beach, Florida, to Cape Hatteras, North Carolina **(Figure 2.1.12)**. From December 1 through March 31, the black sea bass pot closure applies to waters inshore of points 1-28 listed in **Table 2.1.11**; approximately Cape Canaveral, Florida, to Cape Hatteras, North Carolina **(Figure 2.1.13)**.

From November 1 through 30 and from April 1 through 30 each year, the boundaries off Florida and Georgia are nearly 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 m, corresponding with **Alternative 8**.

From December 1 through March 31, 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 and corresponds with **Alternative 4**. 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.

Note: Federal regulations for **Alternative 11** would only apply to that portion of the area within the South Atlantic EEZ. The states would be asked to implement consistent regulations within state waters.

Alternative 12. From November 1 through April 30, the black sea bass pot closure applies to waters inshore of points 1-31 listed in **Table 2.1.12**; approximately Cape Canaveral, Florida, to Cape Hatteras, North Carolina **(Figure 2.1.14)**.

This closure approximates the midpoints between proposed closure **Alternative 4** and **Sub-Alternative 8a**.

Note: Federal regulations for **Alternative 12** would only apply to that portion of the area within the South Atlantic EEZ. The states would be asked to implement consistent regulations within state waters.

Biological Effects:

Black Sea Bass

Regardless of which alternative the Council chooses, no biological impacts to the black sea bass stock are expected. Adverse effects are prevented because the overall harvest in the commercial sector is currently limited to the commercial ACL by the commercial accountability measures (AMs) and the ACL, which is based on the ABC, 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 offer no advantages to the black sea bass stock in terms of further reduced harvest because it is estimated that 97-100% of the ACL would be taken (**Table S-3**). Therefore, there is no difference in the biological effects on black sea bass expected to occur from the alternatives.

The expected closure date ranges for the commercial black sea bass season are shown in **Table S-3**. The ranges of closing dates of the commercial ACL that would be landed are due to different scenarios considered in the analyses (SERO-LAPP-2015-09; included as **Appendix N**). The scenarios considered various combinations of the spatial distribution of landings and effort, and factors that affected catch rate projections.

Table S-3. Expected ACL closure dates for commercial black sea bass with a January 1 fishing year start date.

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Alternative 1	No Closure	No Closure	No Closure	No Closure
Alternative 2	10/2	8/4	10/26 - 11/4	11/19 - 12/3
Alternative 3	11/26 - 12/5	10/4 - 10/17	10/26 - 11/4	11/19 - 12/3
Alternative 4	12/20 - 12/30	12/7 - 12/22	12/11 - 12/18	12/19 - 12/30
Alternative 5	12/16 - 12/24	12/1 - 12/11	12/6 - 12/11	12/15 - 12/23
Alternative 6	12/20 - NC*	12/7 - 12/25	12/10 - 12/20	12/19 - NC
Sub-Alternative 7a	10/11 - 10/12	8/18 - 8/20	10/6 - 10/9	10/7 - 10/9
Sub-Alternative 7b	12/28 - NC	12/18 - 12/30	12/17 - 12/21	12/28 - NC
Sub-Alternative 7c	12/22 - 12/28	12/9 - 12/17	12/11 - 12/14	12/23 - 12/29
Sub-Alternative 8a	12/6 - 12/11	10/14 - 10/25	10/29 - 11/5	12/5 - 12/9
Sub-Alternative 8b	12/29 - NC	12/20 - 12/30	12/18 - 12/21	12/29 - NC
Sub-Alternative 9a	10/28 - 11/9	9/15 - 9/27	10/13 - 10/19	10/24 - 11/3
Sub-Alternative 9b	12/26 - NC	12/15 - 12/28	12/14 - 12/20	12/26 - NC
Alternative 10	12/27 - NC	12/17 - 12/29	12/16 - 12/20	12/28 - NC
Preferred Alternative 11	12/18 - 12/28	12/3 - 12/18	12/6 - 12/13	12/17 - 12/27
Alternative 12	12/15 - 12/23	11/21 - 12/10	12/5 - 12/11	12/14 - 12/22

* NC = No Closure

Source: **Appendix N; Appendix I**

Protected Resources

The potential for serious injury or mortality to North Atlantic right whales should be considered for management measures in the black sea bass pot sector because right whales may be found in the Council's jurisdiction from November 1 through April 30 (NMFS 2008). The bulk of the black sea bass pot sector effort traditionally operated from November to April. Since 2010, the black sea bass pot sector has not opened during this time period due to commercial ACL closures (2010, 2011, and 2012) or by regulation (2013 to present). A regulatory closure of the pot sector from November 1 through April 30 was implemented in 2013, via Regulatory Amendment 19. The pot sector closure was implemented to protect endangered right whales and to expedite the increase in the black sea bass ACL in response to a stock assessment indicating the black sea bass stock had been rebuilt. Had the black sea bass pot closure not been implemented, the potential for black sea bass pot gear interactions with right whales would have increased, requiring re-initiation of formal ESA consultation, which would have delayed the ACL increase.

Prior to the increase in the ACL and black sea bass pot closure, restrictions in the pot sector were implemented via Amendment 18A, effective in 2012, to prevent AMs from being triggered early each fishing season, and mitigate associated negative social and economic impacts. The Council developed Amendment 18A because it determined action was needed to modify the rebuilding strategy including the ABC, ACL, and AMs, reduce participation and effort in the black sea bass pot segment of the snapper grouper fishery; and adjust the system of accountability in the recreational sector. Specifically, the Council established a maximum of 35 pots per fishermen, required that pots must be removed from the water when the trip is completed, an endorsement to limit the number of fishermen (32 fishermen) that could use pots to harvest black sea bass, and reduced the recreational bag limit from 20 to 15 per person per day. Since these restrictions were enacted, the average number of pots in the water per day is 75 for all endorsement holders combined, with a maximum reported number of pots fished on a day of 278; the total pots fished cannot exceed 1,120 pots (32 fishermen times 35 pots) in the South Atlantic (SAFMC 2012a). While not the purpose of the Amendment 18A, many of its requirements likely have some ancillary biological benefits to North Atlantic right whales. However, the most notable large whale entanglement risk reduction measure in the commercial black sea bass pot sector is that the black sea bass fishing season has not co-occurred with the right whale season for the last several years (July 16, 2013; 78 FR 42654).

The alternatives under consideration differ substantially in their potential biological effects on ESA-listed large whales. The comparison of alternatives below is based primarily on the analysis in SERO-LAPP-2014-09 as shown in **Table S-4**. The analysis simulated the potential landings of black sea bass pot endorsement holders during a winter season for **Alternatives 1** through **12**. Factoring in landings by other gear, the date the ACL would be met under each scenario was predicted. The analysis also considers overlays of the co-occurrence of the seasonal distribution of black sea bass pot gear and North Atlantic right whales as a proxy for the relative risk of right whale entanglements under each of the proposed alternatives. Overlaying distributions of right whales with fisheries/ships/etc. is an established way of evaluating risk from activities of

interest (NMFS 2015b, Redfern et al. 2013). Due to differences in right whale sampling protocols and data availability, separate models that overlayed right whale and black sea bass fishing effort were generated for two regions: North Carolina, and South Carolina to Florida. The resulting analysis estimated the relative risk of entanglement for a given alternative in those two regions.

Table S-4. Ranked projected risk of right whale entanglement in pot gear vertical lines (in relative risk units; RRU) under proposed Alternatives in Regulatory Amendment 16. The lowest projected relative risk is labeled as "most protective", while the highest projected relative risk is labeled as "least protective". Alternative 1 is the no action alternative.

RISK	Relative Risk of Alternative (Min-Max in Parentheses)
Low	**Alt1: no risk of entanglement (0 RRU)**
	Alt6: low increase in risk off NC (+2-8 RRU); no additional risk off FL-SC (0-0 RRU).
	Alt4: low increase in risk off NC (+2-8 RRU); low increase in risk off FL-SC (0-3 RRU).
	Alt12: low increase in risk off NC (+3-14 RRU); low increase in risk off FL-SC (2-9 RRU).
	Alt11: low increase in risk off NC (+3-15 RRU); low increase in risk off FL-SC (1-12 RRU).
	Alt5: low increase in risk off NC (+1-2 RRU); low to high increase in risk off FL-SC (11-58 RRU).
	Alt10: low to moderate increase in risk off NC (+6-20 RRU); low to high increase in risk off FL-SC (12-58 RRU).
	Alt8a: low to moderate increase in risk off NC (+6-26 RRU); low to high increase in risk off FL-SC (12-58 RRU).
	Alt3: low to moderate increase in risk off NC (+10-26 RRU); low to high increase in risk off FL-SC (16-52 RRU).
	Alt9a: moderate to high increase in risk off NC (+26-51 RRU); moderate to high increase in risk off FL-SC (30-72 RRU).
	Alt8b: moderate to high increase in risk off NC (+46-50 RRU); high to very high increase in risk off FL-SC (58-77 RRU).
	Alt7c: moderate increase in risk off NC (+46-50 RRU); moderate to high increase in risk off FL-SC (55-76 RRU).
	Alt9b: high increase in risk off NC (+54-63 RRU); high to very high increase in risk off FL-SC (64-83 RRU).
	Alt7b: high increase in risk off NC (+69-74 RRU); high to very high increase in risk off FL-SC (67-94 RRU).
	Alt7a: high increase in risk off NC (+69-74 RRU); very high increase in risk off FL-SC (77-96 RRU).
High	Alt2: very high increase in risk off NC (+100-100 RRU); very high increase in risk off FL-SC (100-100 RRU).
	1-25 RRU = low, 26-50 RRU = moderate, 51-75 RRU= high, 76-100+ RRU = very high

Economic Effects:

The commercial black sea bass sector was closed prior to the end of the fishing year in 2008/2009, on May 15, 2009, when the commercial ACL was met. Prior to that season, the sector operated without closures. **Figure S-1** 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 and January at approximately 18% in each month.

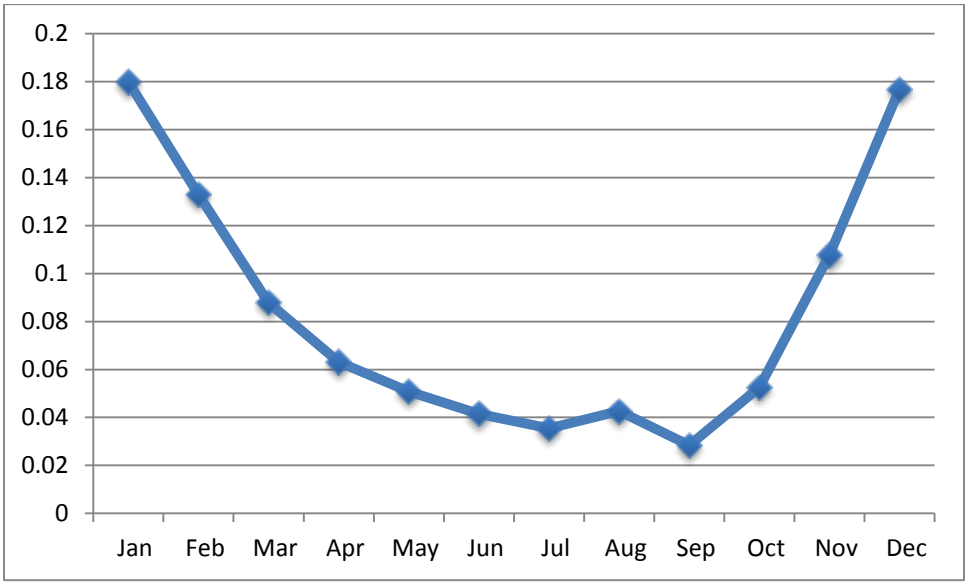

Figure S-1. Percent of average annual commercial black sea bass landings by month from June 2000 through May 2009.
Source: SEFSC/SSRG Economic Panel Data

Expected dockside revenue of the commercial black sea bass portion of the snapper grouper fishery

This analysis of the expected ex-vessel revenue of the alternatives and applied scenarios assumes that consumer demand for black sea bass would at least remain constant regardless of when the fish would 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.

An expected closure date alone does not give the best estimate of expected value because the price per pound changes from month to month and is influenced also by which gear is being used at the time. The highest expected ex-vessel value would 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-LAPP-2014-09 (**Appendix I**) analysis and are based on the assumption that spatial location of gear in future years would 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 S-5** shows the differences in expected dockside values for **Alternative 1 (No Action)** subtracted from each of the **Alternatives 2 – 12** for all four catch rate

scenarios based on monthly price per pound calculations for two different time series, 2000 – 2013 landings and 2011 – 2013 landings.

Table S-5. Expected difference in dockside value of commercial black sea bass under the alternatives of **Action 1** compared to Alternative 1 (No Action) using two price per pound estimates, the four different catch rate scenarios (**Appendix N**), and estimations of spatial locations of gear based on the 2006/2007 through 2008/2009 fishing seasons (Scenario C; **Appendix N**).

	Price/lb years	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Alternative 2	2000-2013	$55,579	$41,654	$54,865	$59,233
	2011-2013	$56,344	$43,028	$55,362	$59,967
Alternative 3	2000-2013	$48,666	$57,925	$53,395	$50,417
	2011-2013	$49,040	$58,597	$53,638	$50,776
Alternative 4	2000-2013	$43,849	$44,929	$46,574	$43,207
	2011-2013	$44,042	$45,276	$46,699	$43,393
Alternative 5	2000-2013	$44,747	$48,036	$45,777	$45,404
	2011-2013	$44,967	$48,431	$45,920	$45,616
Alternative 6	2000-2013	$44,488	$45,844	$41,955	$43,936
	2011-2013	$44,682	$46,194	$42,082	$44,123
Sub-Alternative 7a	2000-2013	$54,285	$45,784	$56,192	$57,759
	2011-2013	$55,050	$47,158	$56,690	$58,494
Sub-Alternative 7b	2000-2013	$53,721	$44,771	$55,776	$57,106
	2011-2013	$54,486	$46,144	$56,273	$57,840
Sub-Alternative 7c	2000-2013	$50,866	$48,204	$50,690	$50,188
	2011-2013	$51,631	$49,578	$51,188	$50,923
Sub-Alternative 8a	2000-2013	$43,933	$52,528	$50,096	$46,268
	2011-2013	$44,230	$53,061	$50,288	$46,553
Sub-Alternative 8b	2000-2013	$50,933	$48,325	$50,797	$50,256
	2011-2013	$51,698	$49,698	$51,295	$50,990
Sub-Alternative 9a	2000-2013	$51,312	$55,582	$56,634	$52,214
	2011-2013	$51,812	$56,480	$56,960	$52,694
Sub-Alternative 9b	2000-2013	$54,038	$47,112	$53,751	$55,192
	2011-2013	$54,803	$48,485	$54,248	$55,926
Alternative 10	2000-2013	$50,933	$48,325	$50,797	$50,256
	2011-2013	$51,698	$49,698	$51,295	$50,990
Preferred Alternative 11	2000-2013	$45,640	$43,541	$45,570	$46,367
	2011-2013	$45,834	$43,889	$45,696	$46,553
Alternative 12	2000-2013	$45,723	$48,492	$44,941	$46,941
	2011-2013	$45,956	$48,911	$45,093	$47,165

The various alternatives and sub-alternatives of **Action 1** shift the balance among the gear that can harvest black sea bass. While **Table S-5** showed total expected differences in values for all the alternatives/sub-alternatives for each of the four catch rates estimated compared to **Alternative 1 (No Action)** by NMFS (2015a), **Table S-6** shows the expected dockside values based on monthly price per pound calculations based on two different time series, 2000 – 2013 landings and 2011 – 2013 landings, but just for pot landings. **Table S-7** is similar to **Table S-6**, but includes only the value of landings for

all non-pot gear landings. And by way of comparison, **Table S-8** shows the estimated percent of total landings by pot gear for the alternatives/sub-alternatives and for each of the four catch rate scenarios.

Table S-6. Expected dockside value of commercial black sea bass using pot gear only under the alternatives of **Action 1** using two price per pound estimates, the four different catch rate scenarios **(Appendix N)**, and estimations of spatial locations of gear based on the 2006/2007 through 2008/2009 fishing seasons (Scenario C; **Appendix N**).

	Price/lb years	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Alternative 1	2000-2013	$462,689	$462,689	$462,689	$462,689
	2011-2013	$488,456	$488,456	$488,456	$488,456
Alternative 2	2000-2013	$724,469	$831,939	$745,783	$737,062
	2011-2013	$832,095	$996,907	$887,610	$850,222
Alternative 3	2000-2013	$664,496	$723,896	$687,255	$668,844
	2011-2013	$760,533	$837,248	$803,188	$761,967
Alternative 4	2000-2013	$565,101	$629,624	$611,748	$569,339
	2011-2013	$634,498	$721,730	$711,203	$640,319
Alternative 5	2000-2013	$585,520	$662,012	$635,352	$591,058
	2011-2013	$660,970	$761,957	$741,575	$668,001
Alternative 6	2000-2013	$565,739	$630,539	$612,009	$570,068
	2011-2013	$635,344	$722,853	$711,270	$641,314
Sub-Alternative 7a	2000-2013	$710,039	$804,150	$719,244	$719,351
	2011-2013	$812,133	$956,191	$846,533	$824,560
Sub-Alternative 7b	2000-2013	$709,475	$803,136	$718,827	$718,698
	2011-2013	$811,393	$954,861	$845,993	$823,700
Sub-Alternative 7c	2000-2013	$689,105	$765,302	$699,146	$692,806
	2011-2013	$781,711	$896,229	$818,255	$786,332
Sub-Alternative 8a	2000-2013	$628,628	$695,146	$672,231	$635,843
	2011-2013	$715,341	$797,732	$784,537	$723,297
Sub-Alternative 8b	2000-2013	$689,172	$765,422	$699,253	$692,874
	2011-2013	$781,793	$896,375	$818,385	$786,414
Sub-Alternative 9a	2000-2013	$682,253	$755,850	$709,469	$688,993
	2011-2013	$774,717	$884,926	$834,595	$783,398
Sub-Alternative 9b	2000-2013	$703,954	$791,798	$716,802	$710,946
	2011-2013	$802,711	$936,438	$843,331	$811,997
Alternative 10	2000-2013	$689,172	$765,422	$699,253	$692,874
	2011-2013	$781,793	$896,375	$818,385	$786,414
Preferred Alternative 11	2000-2013	$576,653	$647,757	$635,145	$582,260
	2011-2013	$652,062	$748,810	$743,778	$659,166
Alternative 12	2000-2013	$591,376	$666,177	$639,396	$597,474
	2011-2013	$668,430	$764,288	$746,439	$676,231

Table S-7. Expected dockside value of commercial black sea bass using non-pot gear under the alternatives of **Action 1** using two price per pound estimates, the four different catch rate scenarios **(Appendix N)**, and estimations of spatial locations of gear based on the 2006/2007 through 2008/2009 fishing seasons (Scenario C; **Appendix N**).

	Price/lb years	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Alternative 1	2000-2013	$866,496	$866,496	$866,496	$866,496
	2011-2013	$1,110,579	$1,110,579	$1,110,579	$1,110,579
Alternative 2	2000-2013	$660,295	$538,900	$638,267	$651,356
	2011-2013	$780,282	$643,937	$755,643	$770,207
Alternative 3	2000-2013	$713,354	$663,214	$695,325	$710,758
	2011-2013	$849,048	$783,787	$822,353	$844,518
Alternative 4	2000-2013	$807,933	$744,490	$764,011	$803,053
	2011-2013	$1,010,593	$902,276	$935,604	$1,002,261
Alternative 5	2000-2013	$788,412	$715,209	$739,610	$783,532
	2011-2013	$977,265	$852,283	$893,944	$968,933
Alternative 6	2000-2013	$807,933	$744,490	$759,131	$803,053
	2011-2013	$1,010,593	$902,276	$927,272	$1,002,261
Sub-Alternative 7a	2000-2013	$673,431	$570,819	$666,134	$667,593
	2011-2013	$796,058	$680,026	$787,293	$789,046
Sub-Alternative 7b	2000-2013	$673,431	$570,819	$666,134	$667,593
	2011-2013	$796,058	$680,026	$787,293	$789,046
Sub-Alternative 7c	2000-2013	$690,946	$612,088	$680,729	$686,568
	2011-2013	$817,094	$726,517	$804,823	$811,835
Sub-Alternative 8a	2000-2013	$744,490	$686,568	$707,050	$739,610
	2011-2013	$902,276	$811,835	$838,047	$893,944
Sub-Alternative 8b	2000-2013	$690,946	$612,088	$680,729	$686,568
	2011-2013	$817,094	$726,517	$804,823	$811,835
Sub-Alternative 9a	2000-2013	$698,244	$628,917	$676,351	$692,406
	2011-2013	$825,859	$745,241	$799,564	$818,847
Sub-Alternative 9b	2000-2013	$679,270	$584,499	$666,134	$673,431
	2011-2013	$803,070	$695,492	$787,293	$796,058
Alternative 10	2000-2013	$690,946	$612,088	$680,729	$686,568
	2011-2013	$817,094	$726,517	$804,823	$811,835
Preferred Alternative 11	2000-2013	$798,173	$724,969	$739,610	$793,293
	2011-2013	$993,929	$868,947	$893,944	$985,597
Alternative 12	2000-2013	$783,532	$711,500	$734,730	$778,652
	2011-2013	$968,933	$845,812	$885,612	$960,601

The alternatives and sub-alternatives of **Action 1** based on when the pot sector is open or closed redistribute the commercial ACL between gear types. **Table S-8** shows the percentage of the total ACL expected to be caught by pot gear by alternative.

Table S-8. Expected dockside value of commercial black sea bass using pot gear only expressed as percent of expected total landings for all gear types under the alternatives of **Action 1** using two price per pound estimates, the four different catch rate scenarios **(Appendix N)**, and estimations of spatial locations of gear based on the 2006/2007 through 2008/2009 fishing seasons (Scenario C; **Appendix N**).

	Price/lb years	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Alternative 1	2000-2013	35%	35%	35%	35%
	2011-2013	31%	31%	31%	31%
Alternative 2	2000-2013	52%	61%	54%	53%
	2011-2013	52%	61%	54%	52%
Alternative 3	2000-2013	48%	52%	50%	48%
	2011-2013	47%	52%	49%	47%
Alternative 4	2000-2013	41%	46%	44%	41%
	2011-2013	39%	44%	43%	39%
Alternative 5	2000-2013	43%	48%	46%	43%
	2011-2013	40%	47%	45%	41%
Alternative 6	2000-2013	41%	46%	45%	42%
	2011-2013	39%	44%	43%	39%
Sub-Alternative 7a	2000-2013	51%	58%	52%	52%
	2011-2013	50%	58%	52%	51%
Sub-Alternative 7b	2000-2013	51%	58%	52%	52%
	2011-2013	50%	58%	52%	51%
Sub-Alternative 7c	2000-2013	50%	56%	51%	50%
	2011-2013	49%	55%	50%	49%
Sub-Alternative 8a	2000-2013	46%	50%	49%	46%
	2011-2013	44%	50%	48%	45%
Sub-Alternative 8b	2000-2013	50%	56%	51%	50%
	2011-2013	49%	55%	50%	49%
Sub-Alternative 9a	2000-2013	49%	55%	51%	50%
	2011-2013	48%	54%	51%	49%
Sub-Alternative 9b	2000-2013	51%	58%	52%	51%
	2011-2013	50%	57%	52%	50%
Alternative 10	2000-2013	50%	56%	51%	50%
	2011-2013	49%	55%	50%	49%
Preferred Alternative 11	2000-2013	42%	47%	46%	42%
	2011-2013	40%	46%	45%	40%
Alternative 12	2000-2013	43%	48%	47%	43%
	2011-2013	41%	47%	46%	41%

Given the uncertainty of how fishery participants would change their behavior in the future, each of the four catch rate scenarios are plausible estimates of future fishing behavior. One way to simplify comparisons between alternatives is to use mean values across the four scenarios for each alternative or sub-alternative. **Table S-9** shows the percent of expected ex-vessel value landed by pot gear averaged across the four landings scenarios as a percent of expected black sea bass ex-vessel values for all gear types combined. Regardless of whether 2000 – 2013 or 2011 – 2013 price per pound values were used, **Alternative 1 (No Action)** had a lower percentage of the expected ex-vessel value landed by pot gear than all of the other alternatives/sub-alternatives considered. When using the 2000 – 2013 price per pound values, **Alternative 2**, **Sub-Alternative 7a**, **Sub-Alternative 7b**, and **Sub-Alternative 9a** had the highest expected percentage of overall ex-vessel values for black sea bass landed by pot gear. When using the 2011 – 2013 price per pound values, **Alternative 2**, **Sub-Alternative 7a**, and **Sub-Alternative 7b** had the highest expected percentage of overall ex-vessel values for black sea bass landed by pot gear.

Table S-9. Mean percentage and ranking of expected ex-vessel value of black sea bass landed by pot gear as a percent of expected ex-vessel value of black sea bass landed by all gear types averaged across the four landings scenarios.

	2000-2013		2011 -2013	
	Mean	Rank	Mean	Rank
Alternative 1	35%	16	31%	16
Alternative 2	55%	1	55%	1
Alternative 3	50%	9	49%	9
Alternative 4	43%	15	41%	15
Alternative 5	45%	12	43%	12
Alternative 6	43%	14	41%	14
Sub-Alternative 7a	53%	2	53%	2
Sub-Alternative 7b	53%	3	53%	3
Sub-Alternative 7c	52%	7	51%	7
Sub-Alternative 8a	48%	10	47%	10
Sub-Alternative 8b	52%	5	51%	5
Sub-Alternative 9a	51%	8	51%	8
Sub-Alternative 9b	53%	4	52%	4
Alternative 10	52%	5	51%	5
Preferred Alternative 11	44%	13	43%	13
Alternative 12	45%	11	44%	11

Economic effects of relative risk to North Atlantic Right Whales and the black sea bass pot sector

Throughout the range of the NARW, the NMFS budgeted $8.7 million in FY 2013 and $8.4 million in FY 2014 in whale recovery budgets. As an example, NMFS (NMFS

SERO PRD 2015) estimates that it cost $87,900 for a multi-agency attempt to rescue a NARW in trap or pot gear in 2010/2011. Between FY 2003 and FY 2005, the costs of actions to reduce fishery bycatch of NARW were between $4.9 million and $7.7 million across several federal and NGO organizations (Reeves et al. 2007). During the fiscal years 2003-2005, the multi-agency costs to promote NARW recovery ranged from $13.1 million to $16.7 million throughout the NARW range.

Potential economic outcomes must be weighed against the chance that a NARW would become entangled in black sea bass pot gear. SERO-LAPP-2014-09 (**Appendix N**) analyzed the potential co-occurrence of black sea bass pot gear and NARW in space and time across the **Action 1** alternatives for a wide variety of potential scenarios (i.e., different assumptions regarding the distribution of pot gear, catch rates, and NARW responses to environmental conditions). In this analysis, co-occurrence was treated as a proxy for relative entanglement risk, an assumption used in other whale risk assessment models (NMFS 2015b; Redfern et al. 2013). The analysis was robust with regards to the differences between alternatives, although the absolute risk of a given alternative cannot be quantified because the entanglement rate of whales in black sea bass pots is unknown.

The **Action 1** alternatives/sub-alternatives can be compared in terms of relative risk as it is operationally defined here. However, the magnitude of the potential relative risk between the alternatives/sub-alternatives in this action cannot be estimated without knowing what the total risk would be if there were no restrictions on using black sea bass pot gear. In this analysis, greater relative risk means the likelihood of entanglements increases when there is more black sea bass pot gear in the water at the same time there is an increase in the presence of whales. In this sense, the alternatives/sub-alternatives can be ranked (e.g., most relative risk to least relative risk); however, the absolute additional amount of risk posed by one alternative/sub-alternative cannot be compared to the absolute amount of risk posed by another alternative/sub-alternative.

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 sector, and direct effects on participants in the hook-and-line sector (and other gear types) 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 account for 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 sector. **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 black sea bass 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 2012), more than half of active pot fishermen did not receive an endorsement and could no longer use black sea bass pots. 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 lbs ww, 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 sector of the black sea bass fishery unless they purchase an existing endorsement.

Fishermen who did receive endorsements were placed under a new trip limit, the new pot limit, and the requirement to bring pots to shore at the end of each trip. When the final rule for Regulatory Amendment 19 (SAFMC 2013b) 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 to expedite the increase in the black sea bass ACL due to the additional time that would have been required for NMFS to complete an ESA Section 7 consultation for the snapper grouper fishery (SAFMC 2013b).] Additionally, black sea bass pot fishermen are required to comply with the ALWTRP gear and seasonal requirements (**Tables 1.8.1 – 1.8.5**), which have been in place for the black sea bass pot sector 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 harvest of 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 the ancillary benefits derived through Amendment 18A (SAFMC 2012).

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 sector 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 2-12**). As discussed in **Appendix N**, 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 commercial sector that contribute to minimizing potential interactions through Council actions and ALWTRP requirements (see **Section 1.8**), the return on investment of additional restrictions such as a spatial/temporal prohibition on black sea bass pot fishing could be low, particularly for the relatively small black sea bass pot sector. Overall, any social benefits that would be expected to result from improved right whale protection would only be realized when biological benefits to the right whales can be measured and demonstrated.

The effects of **Alternatives 2-12** on fishermen and associated communities vary with the temporal and spatial characteristics of the closures, and effects would be different for pot fishermen and hook and line fishermen. In general, allowing harvest with pots in any way during the winter would be beneficial to pot fishermen, but could have negative

effects for all black sea bass fishermen if an increased rate of harvest causes an in-season closure. Additionally, allowing pots during the winter could affect access to the black sea bass commercial ACL for hook and line fishermen, since pots are more efficient gear and could harvest more of the commercial ACL.

Depending on the areas that could be closed to pot fishing and actual areas where fishermen place their pots, **Alternatives 2-12** 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 level of benefits to pot fishermen by increasing access to black sea bass with pots in the winter**.** However, the possible negative effects due to an earlier in-season closure (due to the ACL being met) would also be expected under **Alternatives 2-12.** Because of the location of calving areas, there may be less fishing ground available for Florida pot fishermen for most of the winter months (**Alternatives 2-6**, **7b- Preferred Alternative 11**), except for under **Alternative 7/ Sub-Alternative 7a** that would allow fishing in the winter between December 16 through March 14. However, under this sub-alternative, the interaction with adult whales and calves may be more likely, which could result in further fishing restrictions in the future. The alternative(s) with the smallest area that would close potential fishing grounds for Florida pot fishermen would be expected to the most beneficial to black sea bass pot fishermen in Florida.

For black sea bass pot fishermen in North Carolina and South Carolina, the alternatives with the smallest areas of fishing grounds closed and the shortest period of time would be expected to be the most beneficial. **Alternative 7/ Sub-Alternative 7a, 7b; Alternative 8/Sub-Alternative 8b**; **Alternative 9/ Sub-Alternative 9b**; and **Alternative 10** would allow more time available for harvest with pots in North Carolina and South Carolina than **Alternatives 2-6, Preferred Alternative 11** and **Alternative 12.**

As discussed in **Section 3.3.3**, the black sea bass pot endorsement holders participate in several other fisheries throughout the year. As part of their fishing portfolio, many endorsement holders report that the closure in **Alternative 1 (No Action)** has negative effects on their ability to maximize returns in their overall portfolios. Additional information was collected through public comments about the role of winter pot fishing for the endorsement holders in fishing portfolios and yearly fishing business plans. This information is in **Appendix L** and was presented at the September 2015 Council meeting.

Action 2. Enhance the existing Atlantic Large Whale Take Reduction Plan (ALWTRP) buoy line/weak link gear requirements and buoy line rope marking for black sea bass pots

One or more actions beyond **Alternative 1 (No Action)** may be chosen.

Alternative 1 (No Action). Commercial black sea bass fishermen are required to abide by the pot configuration restrictions, pot escape mechanism requirements, and pot construction and escape mechanism requirements contained in 50 CFR § 622.189 (see discussion below). Additionally, commercial fishermen will continue to fish in compliance with existing buoy line and weak link gear requirements for black sea bass pots as required by the ALWTRP (50 CFR **§** 229.32).

Alternative 2. In addition to the requirements in 50 CFR § 622.189, enhance the current ALWTRP buoy line requirements from November 1 through April 30 in federal waters in the South Atlantic EEZ.

Sub-alternative 2a: The breaking strength must not exceed 2,200 lbs.

Sub-alternative 2b: The breaking line strength must not exceed 1,200 lbs.

Note: Fishermen could decide whether they would want to use the same buoy line from May 1 through October 31.

Alternative 3. In addition to the requirements in 50 CFR § 622.189**,** enhance the current ALWTRP weak link requirements. From November 1 to April 30, the breaking strength of the weak links must not exceed 400 pounds for black sea bass pots in the South Atlantic EEZ.

Note: Fishermen could decide whether they would want to use the same weak link strength from May 1 through October 31.

Preferred Alternative 4. In addition to the requirements in 50 CFR § 622.189, enhance the current ALWTRP gear marking requirements. In addition to the ALWTRP's rope marking requirements, include a feature to specifically distinguish the commercial South Atlantic black sea bass pot component of the snapper grouper fishery. Currently the ALWTRP requires three 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 are deployed. This alternative will require an additional 12-inch wide purple band be added at the end of each required 12-inch colored mark. Each of the three marks would be a total of 24 inches in length. The additional gear marking requirements of this action are required in federal waters from November 15 through April 15 (Southeast Restricted Area North), September 1 through May 31 (Offshore Trap/Pot Area), and September 1 through May 31 (Southern Nearshore Trap/Pot Waters Area).

Action 2 Discussion

50 CFR § 622.189 Restrictions and requirements for sea bass pots.

(a) *Tending restriction*. A sea bass pot in the South Atlantic EEZ may be pulled or tended only by a person (other than an authorized officer) aboard the vessel permitted to fish such pot or aboard another vessel if such vessel has on board written consent of the owner or operator of the vessel so permitted.

(b) *Configuration restriction*. In the South Atlantic EEZ, sea bass pots may not be used or possessed in multiple configurations, that is, two or more pots may not be attached one to another so that their overall dimensions exceed those allowed for an individual sea bass pot. This does not preclude connecting individual pots to a line, such as a "trawl" or trot line.

(c) *Requirement for escape mechanisms*. (1) A sea bass pot that is used or possessed in the South Atlantic EEZ 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) is required to have--

(i) On at least one side, excluding top and bottom, a panel or door with an opening equal to or larger than the interior end of the trap's throat (funnel). The hinges and fasteners of each panel or door must be made of one of the following degradable materials:

(A) Ungalvanized or uncoated iron wire with a diameter not exceeding 0.041 inches (1.0 mm), that is, 19 gauge wire.

(B) Galvanic timed-release mechanisms with a letter grade designation (degradability index) no higher than J.

(ii) An unobstructed escape vent opening on at least two opposite vertical sides, excluding top and bottom. The minimum dimensions of an escape vent opening (based on inside measurement) are:

(A) 1 1/8 by 5 3/4 inches (2.9 by 14.6 cm) for a rectangular vent.

(B) 1.75 by 1.75 inches (4.5 by 4.5 cm) for a square vent.

(C) 2.0-inch (5.1-cm) diameter for a round vent.

(2) [Reserved]

(d) *Construction requirements and mesh sizes*. (1) A sea bass pot used or possessed in the South Atlantic EEZ must have mesh sizes as follows (based on centerline measurements between opposite, parallel wires or netting strands):

(i) For sides of the pot other than the back panel:

(A) Hexagonal mesh (chicken wire)--at least 1.5 inches (3.8 cm) between the wrapped sides;

(B) Square mesh--at least 1.5 inches (3.8 cm) between sides; or

(C) Rectangular mesh--at least 1 inch (2.5 cm) between the longer sides and 2 inches (5.1 cm) between the shorter sides.

(ii) For the entire back panel, *i.e.*, the side of the pot opposite the side that contains the pot entrance, mesh that is at least 2 inches (5.1 cm) between sides.

(2) [Reserved]

(e) *Requirements for pot removal*. (1) A sea bass pot must be removed from the water in the South Atlantic EEZ and the vessel must be returned to a dock, berth, beach, seawall, or ramp at the conclusion of each trip. Sea bass pots may remain on the vessel at the conclusion of each trip.

(2) A sea bass pot must be removed from the water in the South Atlantic EEZ when the applicable quota specified in § 622.190(a)(5) is reached. After a closure is in effect, a black sea bass may not be retained by a vessel that has a sea bass pot on board.

(f) *Restriction on number of pots*. A vessel that has on board a valid Federal commercial permit for South Atlantic snapper-grouper and a South Atlantic black sea bass pot endorsement that fishes in the South Atlantic EEZ on a trip with black sea bass pots, may possess only 35 black sea bass pots per vessel per permit year. Each black sea bass pot in the water or onboard a vessel in the South Atlantic EEZ, must have a valid identification tag attached. Endorsement holders must apply for new tags each permit year through NMFS to replace tags from the previous year.

Biological Effects:

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 Council chooses, no biological impacts to the black sea bass stock are expected. Adverse biological effects are prevented because the overall harvest in the commercial sector is limited to the commercial ACL; commercial AMs are also in place. The ACL, which is based on the ABC, 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 sector 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

Alternative 2 is likely to maintain or slightly reduce the overall breaking strength of line used in the commercial black sea bass pot sector throughout the Council's jurisdiction. Reduced line breaking strength can be less life threatening to large whales than lines with higher breaking strength if line breaking strength is below the threshold at which whales can safely break free from the lines. Knowlton et al. (2015) suggest that if buoy line breaking strength was 1,700 pounds (lbs) or less, the number of life-threatening entanglements to large whales would be reduced substantially. **Sub-alternative 2a** (maximum line strength of 2,200 lbs) would likely maintain the breaking strength of lines currently being used and would have limited, if any, benefits for listed whale species. **Sub-Alternative 2b** (maximum line strength of 1,200 lbs) would likely result in substantially fewer life-threatening entanglements for humpback whales and juvenile and adult right whales. The breaking strength in both **Sub-Alternatives 2a** and **2b** is greater than what minke whales are able to escape from (Knowlton et al in press). Given that very young right whale calves are smaller and weaker than minke whales, the breaking

strength of both sub-alternatives is also likely greater than what young calves could shed. Consequently, it is not clear if **Sub-Alternative 2b** would provide very young right whale calves any greater chance of breaking free from line than the lines allowed under **Sub-Alternative 2a**.

The biological impacts from **Alternative 3** on ESA-listed whales is unclear, but are likely beneficial. Weak links break apart when enough opposing pressure is applied to either side of the link. On pot gear, weak links are installed where the surface buoy attaches to the buoy (vertical) line. When the weak link breaks, it releases the buoy from the vertical buoy line and attached pot. A benefit of releasing the buoy is that the remaining entangling line will then be free to slide through baleen or over/around flippers and be shed by a free-swimming whale. Weak link provisions are likely to reduce entanglement risk relative to lines without weak links because the buoys can break away allowing the remaining gear to be potentially shed by the whale. A breaking strength of 400 lbs may be low enough to be broken by very young right whale calves. However, since adequate opposing pressure must be applied to the weak link to break the link, it is unclear how effective this measure will be on a case by case basis.

Preferred Alternative 4 provides a mechanism to identify if a line entangling a whale belongs to the black sea bass pot sector. There are no direct biological benefits from **Preferred Alternative 4**, however, any information gained from entangled whales on fishery type, entanglement location, and entanglement date is important to assess the impacts of a fishery and better understand and possibly work towards reducing future entanglements. However, not all gear remains on the individual whale after an interaction occurs. Furthermore, many entangled right whales are never seen nor is gear recovered. For line markings to be effective, the gear must be recovered, and the recovered gear must retain the marks. Line markings do improve the chances of identifying recovered gear, particularly as the number and size of marks increases. This alternative provides a mechanism to identify the black sea bass pot sector 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 (http://www.greateratlantic.fisheries.noaa.gov/protected/whaletrp/docs/2015-12869.pdf).

None of these alternatives would reduce the potential of interaction between a black sea bass pot and ESA-listed whales. However, the alternatives could reduce the potential of serious injury or mortality (**Alternatives 2** and **3**) and potentially identify or eliminate the black sea bass pot sector gear implicated in an entanglement (**Preferred Alternative 4**).

Economic Effects:

The estimates of costs associated with **Alternatives 2 – 4 (Preferred)** 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) except where noted.

Alternative 2, Sub-Alternative 2a would require minimum line breaking strength of 2,200 lbs for North Carolina, which the ALWTRP already requires for South Carolina, Georgia, and Florida (**Alternative 1 – No Action**). A typical black sea bass pot buoy line is 100 to 130 feet in length (Jack Cox, pers. comm.) Assuming all 17 North Carolina fishermen with black sea bass pot endorsements have 35 pots and need to replace all the buoy lines, at 125 feet per pot, the cost to buy four bundles of line would be $716 (5 bundles x $179/bundle = $895, with each bundle having 1,000' of line and with 35 pots x 125 feet = 4,350' buoy line would be needed). The total expected maximum cost associated with **Alternative 2, Sub-Alternative 2a** is $12,172 (17 x $716). It is not known how many black sea bass pot fishermen currently use buoy line with a breaking strength less than 1,200 lbs as proscribed by **Sub-Alternative 2b**. The worst case scenario is that all 32 endorsement holders would have to buy new buoy line at $149 per 1,000 foot bundle, or $745, assuming fishermen would attach 125 feet of buoy line to each pot (35 pots x 125' = 4,350' buoy line). The total expected maximum cost associated with **Sub-Alternative 2b** is $23,840.

Alternative 3 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 ALWTRP required links have a 600 lb breaking strength. The cost for new weak links for each fisherman is estimated to be $65 (35 pots x $1.85 per weak link). The total cost for **Alternative 3** for all endorsement holders is expected to be $2,080.

Preferred Alternative 4 would require fishermen to mark three 12 inch 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 buoy lines for 35 pots. The cost for a quart of marine buoy paint is $47.35. The total maximum cost associated with **Preferred Alternative 4** if all endorsement holders marked their lines with paint is $1,515 (32 x $47.35). Some fishermen have reported that they mark their lines by weaving in surveyor's tape. Checking various sources online (www.amazon.com, www.uline.com/BL_6423/Flagging-Tape, and www.tigersupplies.com) show that rolls of 300' of surveyor's tape costs $3 - $11 per roll. Presumably, three 12 inch strips per pot would come out to 105 feet to initially equip each pot line. Therefore, if an endorsement holder decided to use surveyor's tape to mark lines, one roll would be needed. If all endorsement holders used surveyor's tape, the total cost would be between $96 (32 x $3) and $352 (32 x $11).

Social Effects:

In general, there could be some economic costs for fishermen if gear specifications require purchase of additional line and marking supplies. This could affect business cost decisions, which may have some negative effects on crew and associated shoreside support. Under **Alternative 1 (No Action)**, these effects would not be expected because the black sea bass pot fishermen are already required to have the ALWTRP gear specifications. Changing the specified breaking strength under **Alternatives 2 – 4 (Preferred)** would likely increase business costs for some black sea bass pot fishermen by requiring new gear to meet the requirements. The time periods specified in **Sub-Alternative 2a** and **Sub-Alternative 2b** would likely have similar effects on black sea bass pot fishermen, because if the breaking strength or gear marking is required in only one part of the year (**Sub-alternative 2a**) would likely be as much of a burden in terms of requiring new or additional gear purchases as a year-round requirement (**Sub-alternative 2b**). Changing the specified breaking strength under **Sub-alternative 2a** would have the same effects on fishermen and communities in Florida, South Carolina, and Georgia as under **Alternative 1 (No Action).** However, **Sub-alternative 2a** would be expected to have some impact on black sea bass pot fishermen working in North Carolina because different gear would be required. **Sub-alternative 2b** would be expected to affect all black sea bass pot fishermen by increasing gear costs. The gear marking requirement in **Preferred Alternative 4** may be beneficial to the black sea bass pot fishermen by allowing NMFS to better identify gear associated with entanglements, which could help decipher entanglements with gear from other fisheries versus black sea bass pot gear.

Chapter 1.
Introduction

1.1 What Actions Are Being Proposed?

Fishery managers are reducing the temporal and spatial scope of the annual prohibition on the use of commercial black sea bass pot gear in the South Atlantic from November 1 through April 30. Fishery managers are also enhancing 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.

1.2 Who is Proposing the Actions?

The South Atlantic Fishery Management Council (Council) is proposing the action pursuant to the Magnuson-Stevens Conservation and Management Act (Magnuson-Stevens Act). The Council develops the framework amendment and sends it to the National Marine Fisheries Service (NMFS) who publishes a rule to implement the framework 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, Florida)

1.3 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 (EEZ) 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, North Carolina) and 28°35.1′ N. lat. (due east of the NASA Vehicle Assembly Building, Cape Canaveral, Florida) (**Figure 1.3.1**). Black sea bass is one of 59 fish managed by the Council under the Snapper Grouper FMP.

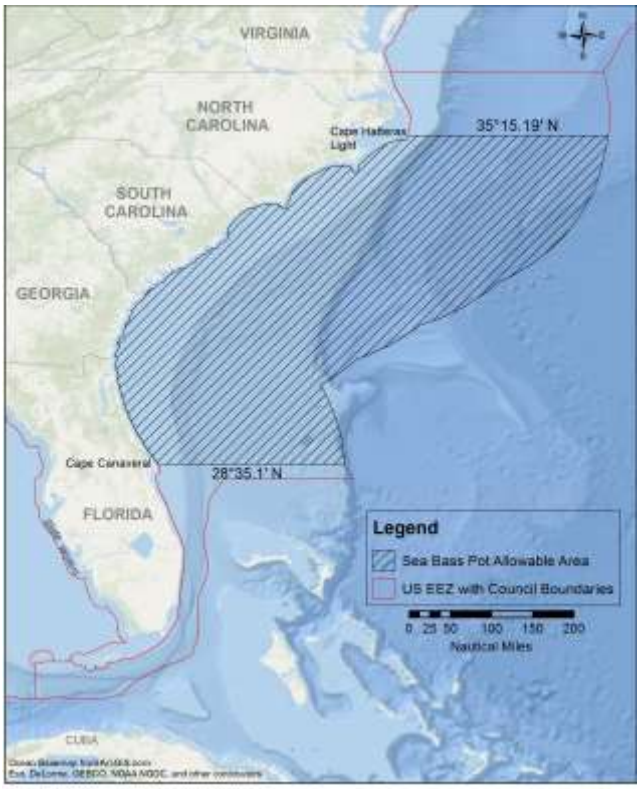

Figure 1.3.1. Jurisdictional boundaries of the South Atlantic Fishery Management Council and the allowable black sea bass pot area.

1.4 Why is the Council Considering Action?

The Council wants to reverse adverse socioeconomic impacts to black sea bass pot endorsement holders created by the annual November 1 through April 30 prohibition on the use of black sea bass pot gear and to increase flexibility to black sea bass pot endorsement holders while continuing to afford protection to Endangered Species Act (ESA)-listed whales in the South Atlantic region. In addition, the Council wants to reduce adverse effects to whales if entangled and to help identify black sea bass pot gear used in the South Atlantic.

Purpose for Action

The purpose of Regulatory Amendment 16 is to reevaluate the annual November 1 through April 30 prohibition on the use of black sea bass pot gear, and enhance 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 reduce the adverse socioeconomic impacts resulting from the annual November 1 through April 30 prohibition on the use of black sea bass pot gear and increase the flexibility of black sea bass pot endorsement holders to fish with this gear while continuing to protect ESA-listed whales in the South Atlantic region; and reduce the adverse effects on whales if entangled and help identify black sea bass pot lines used in the South Atlantic.

1.5 Why Did the Council and NMFS Implement the November 1 through April 30 Prohibition on the Use of Black Sea Bass Pot Gear?

A 2003 stock assessment concluded that black sea bass were overfished and undergoing overfishing. In response to the stock assessment and to end overfishing, a quota was established and the allowable harvest of black sea bass was reduced beginning in 2006, and the fishing year was changed to June 1 through May 31. 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 Snapper Grouper FMP (Regulatory Amendment 19; SAFMC 2013b), modified the ABC, ACLs, recreational annual catch target (ACT), and optimum yield (OY) for the black sea bass stock.

The Council and NMFS implemented the November 1 to April 30 prohibition on the use of black sea bass pots through the final rule for Regulatory Amendment 19 to the Snapper Grouper FMP to ensure protection of North Atlantic right whales (NARW) while allowing for an increase in the black sea bass commercial ACL in 2013 without significant delay in implementation of the regulations.

Increasing the commercial ACL could have extended fishing activity with black sea bass pot gear later into the year. Black sea bass pot gear could potentially be used past November 1, the onset of right whale calving season in the South Atlantic and migration of large ESA-listed whales, increasing the risk of interactions between these species and this gear type. Therefore, 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 required under the ESA. Formal consultation requires development of a biological opinion to analyze the potential effects of black sea bass pot gear fished during NARW calving season on those ESA listed whale species. That analysis could 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, 2013. 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 opinion and Environmental Impact Statement could have been completed.

1.6 Why is Allowing Fishing in the Wintertime Important to Some Fishermen?

Some fishermen have reported a desire to resume fishing in the winter months for black sea bass using pot gear. They have reported that, during winter months, (1) the price per pound is higher (**Figure 1.6.1**), (2) black sea bass migrate southward and are generally found closer to shore making them easier to harvest, and (3) black sea bass tend to be darker and larger, which commands a higher price on the market. The black sea bass stock north of Virginia in the Mid-Atlantic region is closed in the winter,

which increases the price for black sea bass harvested in the South Atlantic region.

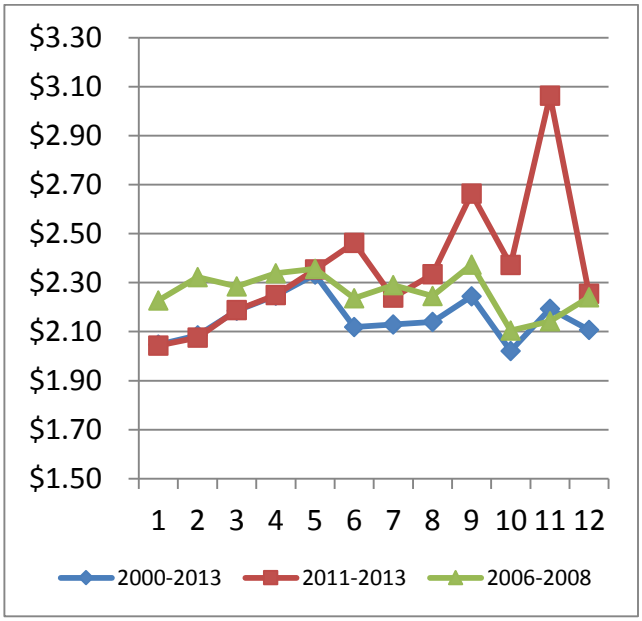

Figure 1.6.1. Average price per pound (whole weight) in the South Atlantic region for black sea bass by month for 2000 – 2013 and 2011 – 2013 (in 2013 dollars).
Source: SEFSC/SSRG Economic Panel Data, ACL_Tables_07102914

1.7 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 1.7.1**) (SEDAR 25 Update 2013). **Section 3.2.1.1** 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 2013b) 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 1.7.1. 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.	

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

1.8.1. 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 (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 2012) 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 2012) 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 2013b) made adjustments to the ACLs (including sector ACLs), recreational ACT, and OY 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 SEDAR stock assessment update for black sea bass was completed in 2013, and results indicated the ACL for this species could be increased based upon the new ABC levels recommended by the SSC. The stock assessment update showed that 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 D**.

1.8.2 Atlantic Large Whale Take Reduction Plan

In addition to the Council regulations, the commercial black sea bass pot sector 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 pot fishery, as managed by the Council, are listed in **Tables 1.8.1** through **1.8.5** and the times and areas where the restrictions apply in the South Atlantic are illustrated in **Figure 1.8.1**. These measures would remain in place regardless of any actions implemented through Regulatory Amendment 16.

Table 1.8.1. ALWTRP measures that are applicable to the those fishing black sea bass pots.

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; 3 marks of 12 in 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; 3 marks of 12 in 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 section 229.32, available online at http://www.nero.noaa.gov/whaletrp/.	

Table 1.8.2. Southeast Trap/Pot Management Areas, Offshore Trap/Pot Waters.

LOCATION DESCRIPTION		
Offshore Trap/Pot Waters off South Carolina, Georgia, and Florida includes all Federal waters of the EEZ offshore of the Southern Nearshore Trap/pot Waters and the Southeast U.S. Restricted Area North south to 27°51'N. lat.		
DATES	**AREA**	**RESTRICTIONS/REQUIREMENTS SUMMARY**
Sept. 1- May 31	North of 32° N. lat.	• Universal requirements • Gear marking -BLACK • Weak links ≤ 1,500 lbs breaking strength and, ≤ 2,000 lbs breaking strength for the red crab trap/pot fishery. • Sinking groundlines
Nov. 15-April 15	Between 32° N. lat and 29° N. lat	• Universal requirements • Gear marking- **BLACK** • Weak links ≤ 1,500 lbs breaking strength and, ≤ 2,000 lbs breaking strength for the red crab trap/pot fishery. • Sinking groundlines
Dec. 1- March 31	Between 29°N. lat and 27° 51' N. lat	• Universal requirements • Gear marking- **BLACK** • Weak links ≤ 1,500 lbs breaking strength and, ≤ 2,000 lbs breaking strength for the red crab trap/pot fishery. • Sinking groundlines

Source: NOAA 2015b

Table 1.8.3. Southeast Trap/Pot Management Areas, Southeast Restricted Area North.

LOCATION DESCRIPTION		
The Southeast U.S. Restricted Area North includes waters north of 29°00' N. (near Ponce de Leon Inlet, FL) to 32°00' N. (near the GA/SC border) from the shoreline eastward to 80°00' W, and off South Caro- lina, within 35 nautical miles of the shoreline. Little River Inlet, SC, is not located in the Southeast U.S. Restricted Area North.		
DATES	**AREA**	**RESTRICTIONS/REQUIREMENTS SUMMARY**
November 15 - April 15	ALL of Southeast Restricted Area North	• Universal requirements • Gear markings- SEE BELOW • Buoy lines must be made of sinking line • Buoy lines- Only single traps are allowed. Also, whole buoy line (from trap/pot to buoy) must be the same diameter and free of objects (e.g., weights, floats, etc.) and the buoy line must be made of sinking line.
	FL State Waters	• See above • Weak links- ≤ 200lbs • Vertical line breaking strength ≤ 1,500 lbs • Gear marking- BLUE & ORANGE
	SC/GA State waters	• See above • Weak links- ≤ 600lbs • Vertical line breaking strength ≤ 2,200 lbs • Gear marking- BLUE & ORANGE
	Federal waters	• See above • Weak links- ≤ 600lbs • Vertical line breaking strength ≤ 2,200 lbs • Gear marking-GREEN & ORANGE • Trap/pot gear must be brought back to shore at the conclusion of each trip.

Source: NOAA 2015b

Table 1.8.4. Mid-Atlantic Trap/Pot Management Areas, Southern Nearshore Trap/Pot Waters.

MANAGEMENT AREA DESCRIPTION	
Southern Nearshore Trap/Pot Waters includes all state and Federal waters which fall within EEZ Near- shore Management Area 4, EEZ Nearshore Management Area 5, and EEZ Nearshore Management Area 6 (as defined in the American Lobster Fishery regulations in 50 CFR 697.18), and inside the 100fa contour line from 35°30' N. lat. south to 27°51' N. lat. and extending inshore to the shoreline or exemption line, with the exception of the exempted waters (see Supplement A-Exempted Areas).	
DATES	**RESTRICTIONS/REQUIREMENTS SUMMARY**
Sept. 1- May 31	• Universal requirements • Gear marking- ORANGE • Weak links ≤ 600lbs breaking strength • Sinking groundline • Please note- a small portion of these waters includes portions of LMA 6 (near the mouth of Long Island Sound). These waters follow year-round regulations as described in the "Northeast Trap/Pot Fisheries Management Areas."

Source: NOAA 2015b

Table 1.8.5. Mid-Atlantic Trap/Pot Management Areas, Offshore Trap/Pot Waters (Mid-Atlantic).

LOCATION DESCRIPTION	
Offshore Trap/Pot Waters includes all Federal waters of the EEZ Offshore Management Area 3 (in- cluding the areas known as the Area 2/3 Overlap and 3/5 Overlap, as defined in the American Lobster Fishery regulations found at 50 CFR 697.18), with the exception of the Great South Channel Restricted Trap/Pot Area, and extending south along the 100fa contour line from 35°30' N. lat. south to 27°51' N. lat., and east to the eastern edge of the EEZ.	
DATES	**RESTRICTIONS/REQUIREMENTS SUMMARY**
Sept. 1- May 31	• Universal requirements • Gear marking- **BLACK** • Weak links ≤ 1,500 lbs breaking strength and, ≤ 2,000 lbs breaking strength for the red crab trap/pot fishery • Sinking groundlines • No trap restrictions in offshore waters south of 40 degrees

Source: NOAA 2015b

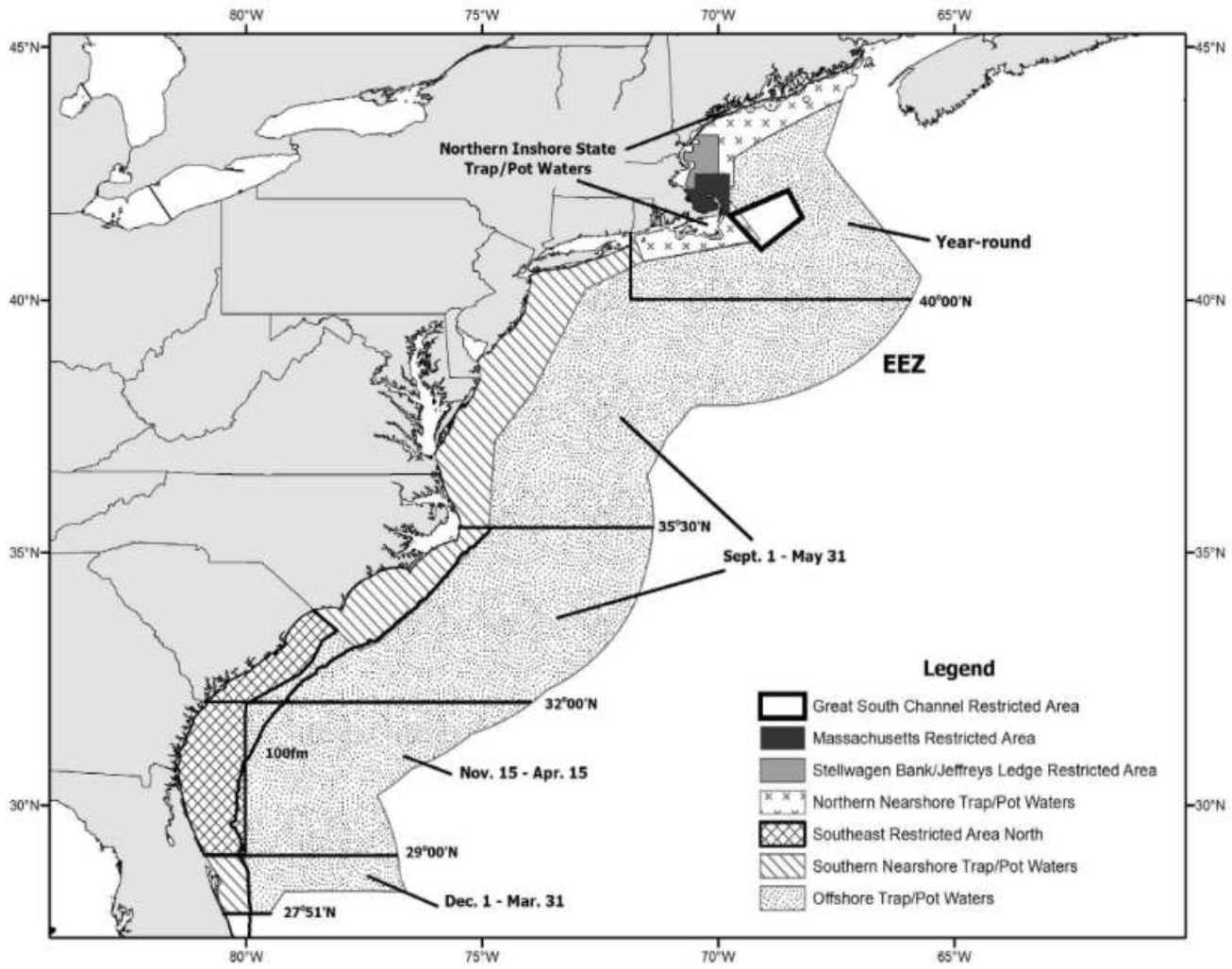

Figure 1.8.1. Times and areas where ALWTRP measures are in effect for the southern commercial black sea bass pot fishery.

Chapter 2. Proposed Actions and Alternatives

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

2.1.1 Action 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 where black sea bass is managed in the South Atlantic EEZ (south of Cape Hatteras, North Carolina; **Figure 2.1.1**).

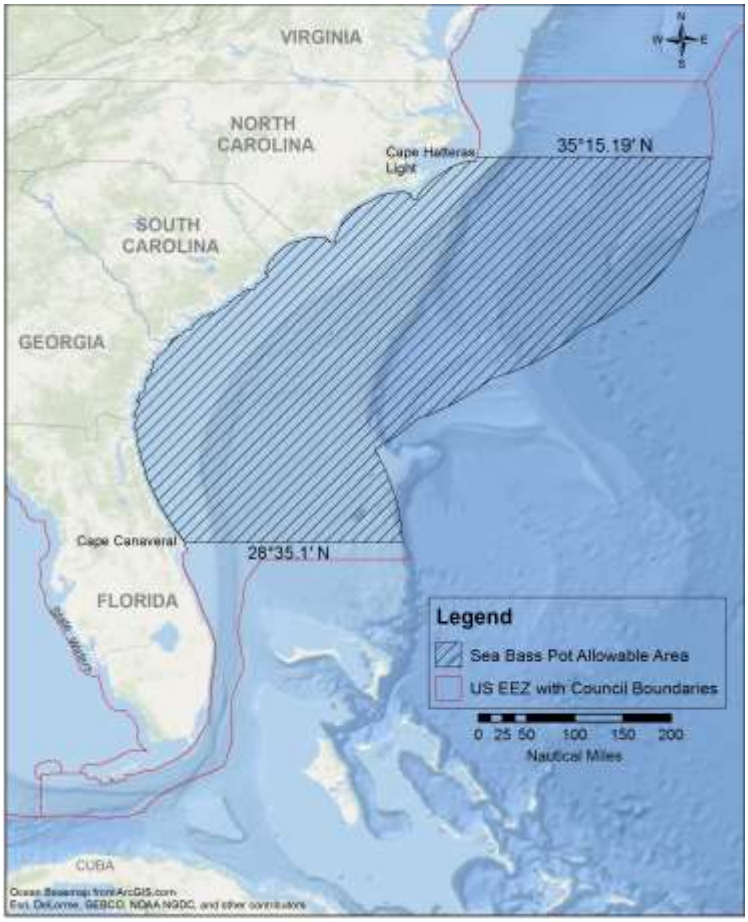

Figure 2.1.1. Jurisdictional boundaries of the South Atlantic Fishery Management Council and the allowable black sea bass pot area.

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 Fishery Management Plan for the Snapper Grouper Fishery 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 1.8.1** through **1.8.5.** for measures mandated through the Atlantic Large Whale Take Reduction Plan.

A transit provision is needed to allow vessels to transit through areas closed to sea bass pots. Having a transit provision would keep vessels with black sea bass pots onboard from having to transit north or south of the closed area to get to their fishing grounds. Not having a transit provision would be a hardship that would force some vessels to travel hundreds of miles. This transit provision applies to all **Alternatives** and **Sub-alternatives 2** through **12** for Action 1. Sea bass pots must be removed from the water in the applicable closed area within the South Atlantic EEZ before the applicable time period, and may not be onboard a vessel in the closed area within the South Atlantic EEZ during the applicable closure, except for such sea bass pot gear appropriately stowed onboard a vessel in transit through the closed area. Transit means non-stop progression through the area; fishing gear appropriately stowed means all black sea bass pot gear must be out of the water and on board the deck of the vessel. All buoys must either be disconnected from the gear or stowed within the sea bass pot. Disconnected buoys may remain on deck.

Alternative 2. The black sea bass pot closure applies to the area currently designated as North Atlantic right whale critical habitat **(Figure 2.1.2)**. 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.

This area represents North Atlantic right whale critical habitat in the South Atlantic region designated on June 3, 1994. **Figure 2.1.2** provides location of the critical habitat boundary. The critical habitat designation did not provide waypoints for the boundary. The boundary and area in **Alternative 2** would not automatically change if the boundary for the right whale critical habitat were to change. On January 26, 2016, NMFS issued a final rule that created an expansion of the critical habitat area. The South Atlantic Council voted in December 2015 to

send this amendment in for U.S. Secretary of Commerce review prior to the publication of the final rule for the North Atlantic right whale critical habitat area expansion.

The following is language describing the North Atlantic right whale critical habitat area from 50 CFR § 226.203(c):

> *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.*

Note: Federal regulations for **Alternative 2** would only apply to that portion of the area within the South Atlantic EEZ. The states would be asked to implement compatible regulations within state waters.

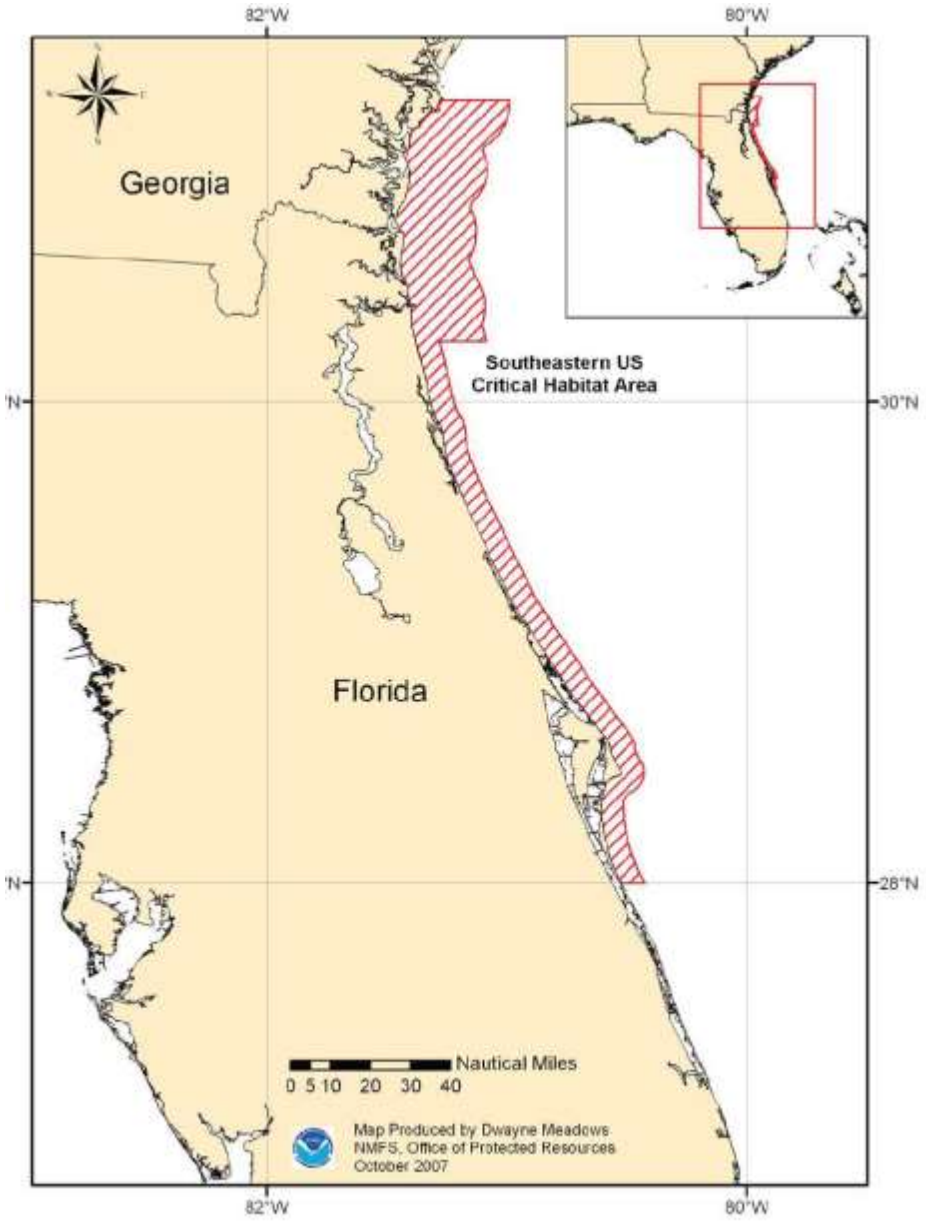

Figure 2.1.2. Area for the proposed black sea bass pot closure in **Alternative 2.**
Source: http://www.fisheries.noaa.gov/pr/pdfs/criticalhabitat/northatlanticrightwhale.pdf

The following is language describing the North Atlantic right whale critical habitat area from 50 CFR § 226.203(c) as designated on January 26, 2016:

> *Southeastern United States: Includes marine waters from Cape Fear, North Carolina, southward to 28°N latitude (approximately 31 miles south of Cape Canaveral, Florida) within the area bounded on the west by the shoreline and the 72 COLREGS lines, and on the east by rhumb lines connecting the following points in the order stated from north to south.*

N. Latitude	**W. Longitude**
33°51’ N	at shoreline
33°42’ N	77°43’ W
33°37’ N	77°47’ W
33°28’ N	78°33’ W
32°59’ N	78°50’ W
32°17’ N	79°53’ W
31°31’ N	80°33’ W
30°43’ N	80°49’ W
30°30’ N	81°01’ W
29°45’ N	81°01’ W
29°15’ N	80º55’ W
29°08’ N	80°51’ W
28°50’ N	80°39’ W
28°38’ N	80°30’ W
28°28’ N	80°26’ W
28°24’ N	80°27’ W
28°21’ N	80°31’ W
28°16’ N	80°31’ W
28°11’ N	80°33’ W
28°00’	80º29’- W
28°00’ N	At shoreline

Alternative 3. The black sea bass pot closure applies to waters inshore of points 1-15 listed below in **Table 2.1.1**; approximately Ponce Inlet, Florida, to Cape Hatteras, North Carolina **(Figure 2.1.3)**. The closure applies to the area annually from November 1 through April 30.

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.

Note: Federal regulations for **Alternative 3** would only apply to that portion of the area within the South Atlantic EEZ. The states would be asked to implement compatible regulations within state waters.

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: Amanda Frick, NMFS SERO

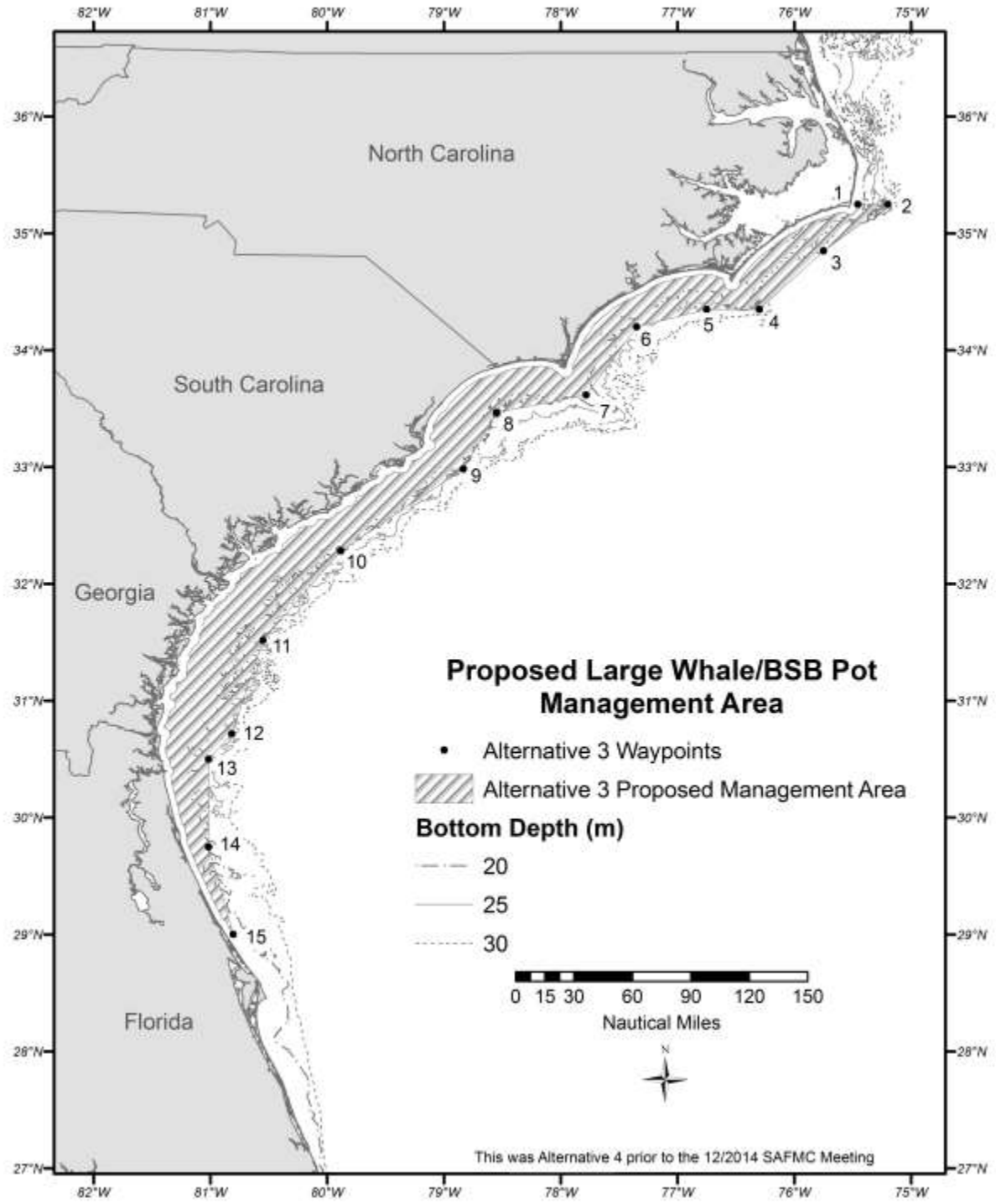

Figure 2.1.3. Area for the proposed black sea bass pot closure in **Alternative 3.**
Source: Amanda Frick, NMFS SERO

Alternative 4. The black sea bass pot closure applies to waters inshore of points 1-28 listed in **Table 2.1.2**; approximately Cape Canaveral, Florida, to Cape Hatteras, North Carolina **(Figure 2.1.4)**. The closure applies to the area annually from November 1 through April 30.

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.

Note: Federal regulations for **Alternative 4** would only apply to that portion of the area within the South Atlantic EEZ. The states would be asked to implement compatible regulations within state waters.

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

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

Source: Amanda Frick, NMFS SERO

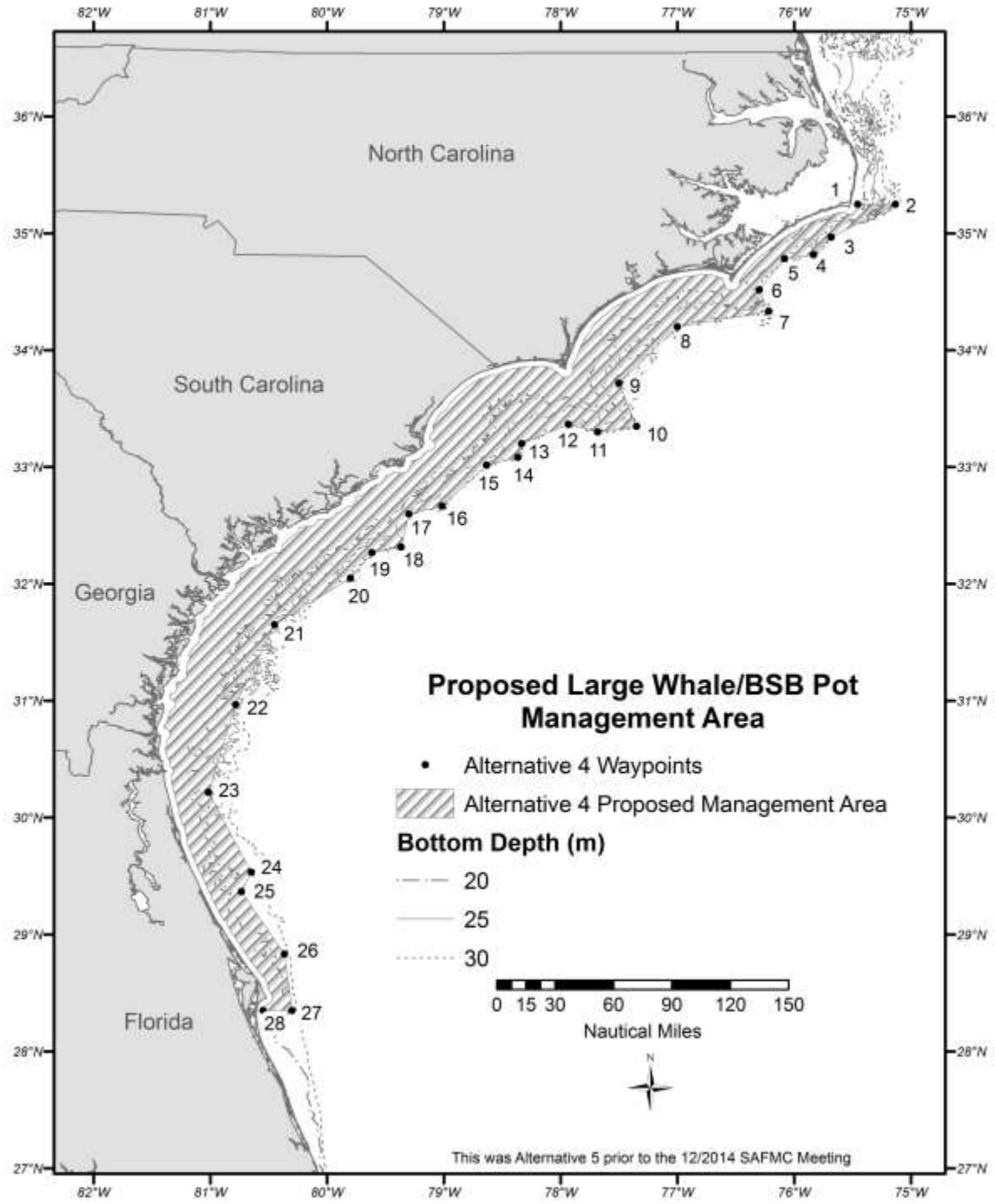

Figure 2.1.4. Area for the proposed black sea bass pot closure in **Alternative 4**.
Source: Amanda Frick, NMFS SERO

Alternative 5. The black sea bass pot closure applies to waters inshore of points 1-28 listed in **Table 2.1.3**; approximately Daytona Beach, Florida, to Cape Hatteras, North Carolina **(Figure 2.1.5)**. The closure applies to the area annually from November 1 through April 30.

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 a 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 start of the EEZ to 30 nautical miles offshore. The map below provides approximate location of proposed boundary.

Note: Federal regulations for **Alternative 5** would only apply to that portion of the area within the South Atlantic EEZ. The states would be asked to implement compatible regulations within state waters.

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

Point	N. Latitude	W. Longitude	Point	N. Latitude	W. Longitude
1	35°15'	State/EEZ Boundary	15	33°21'	77°45'
2	35°15'	74°54'	16	33°19'	78°02'
3	35°03'	74°57'	17	33°24'	78°17'
4	34°51'	75°06'	18	33°14'	78°33'
5	34°45'	75°18'	19	32°55'	78°39'
6	34°43'	75°33'	20	32°39'	78°56'
7	34°26'	75°57'	21	31°42'	80°24'
8	34°12'	76°07'	22	31°31'	80°33'
9	34°04'	76°26'	23	30°43'	80°49'
10	34°05'	76°41'	24	30°30'	81°01'
11	34°10'	76°55'	25	29°45'	81°01'
12	33°58'	77°16'	26	29°31'	80°58'
13	33°41'	77°23'	27	29°13'	80°52'
14	33°28'	77°32'	28	29°13'	State/EEZ boundary

Source: Amanda Frick, NMFS SERO

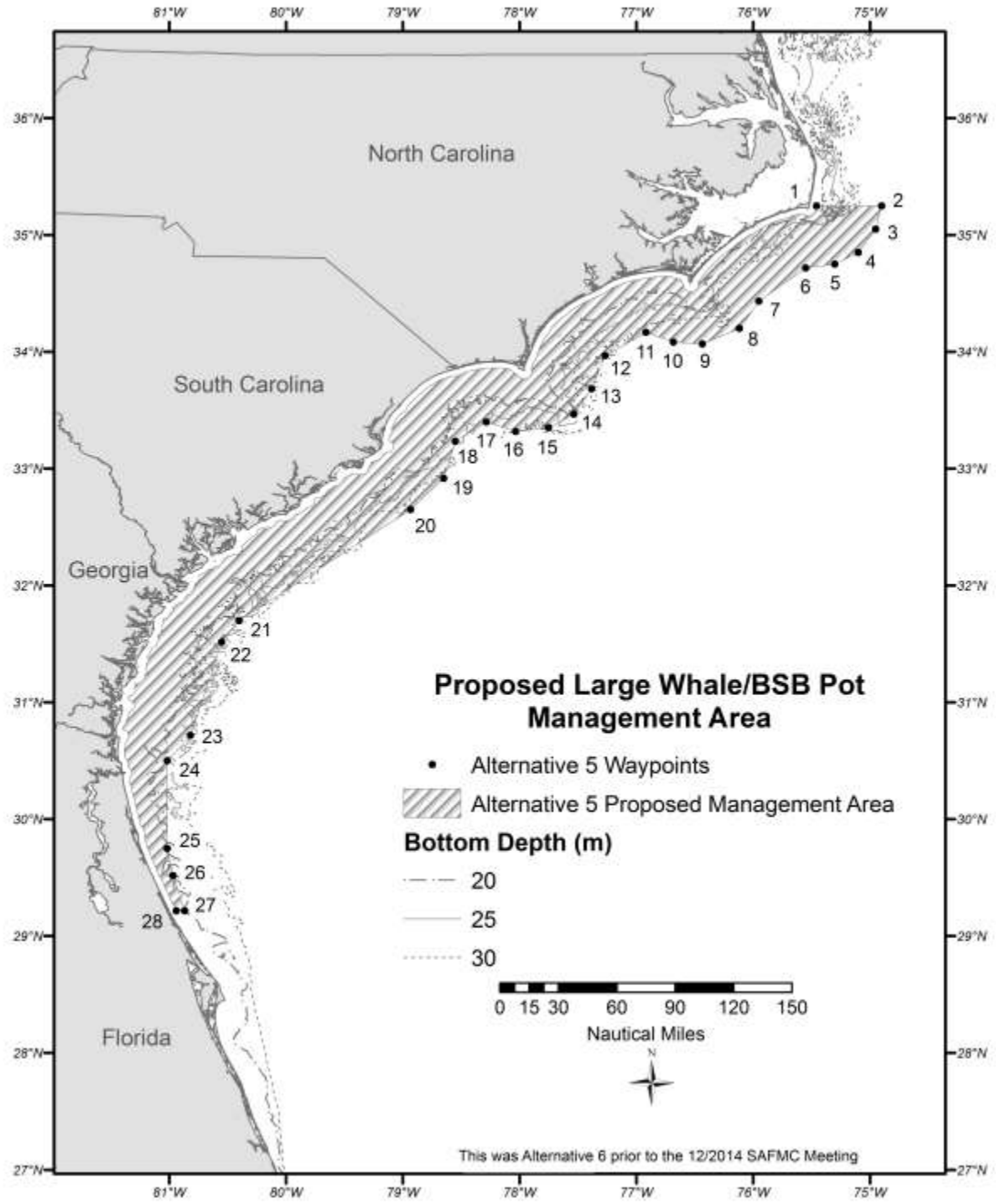

Figure 2.1.5. Area for the proposed black sea bass pot closure in **Alternative 5**.
Source: Amanda Frick, NMFS SERO

Alternative 6. The black sea bass pot closure applies to waters inshore of points 1-20 listed in **Table 2.1.4**; approximately Sebastian, Florida, to Cape Hatteras, North Carolina (**Figure 2.1.6**). The closure applies to the area annually from November 1 through April 30.

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 a 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.

Note: Federal regulations for **Alternative 6** would only apply to that portion of the area within the South Atlantic EEZ. The states would be asked to implement compatible regulations within state waters.

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: Amanda Frick, NMFS SERO

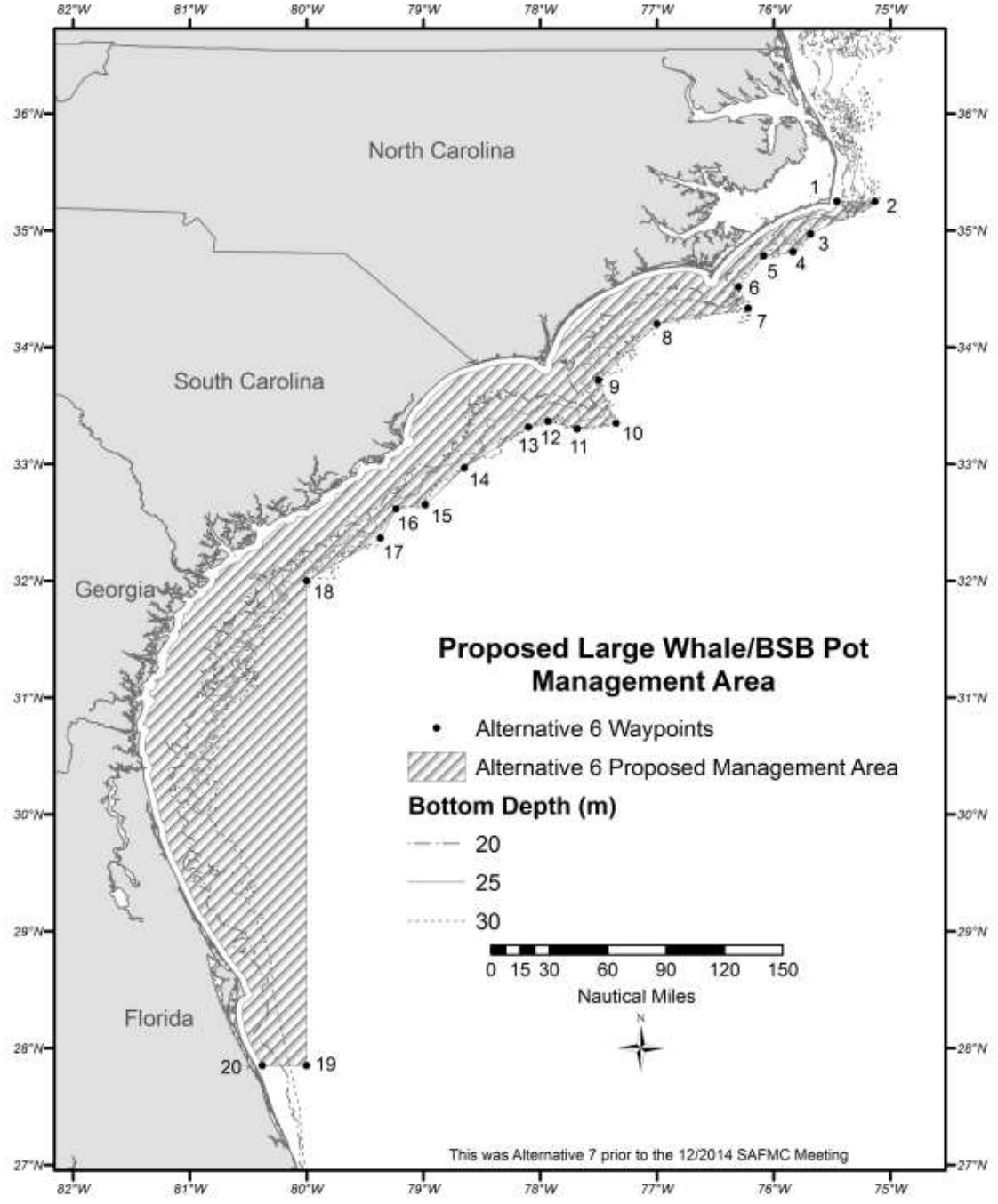

Figure 2.1.6. Area for the proposed black sea bass pot closure in **Alternative 6**.
Source: Amanda Frick, NMFS SERO

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 in **Table 2.1.5**; approximately North of the Altamaha River, Georgia, to Cape Hatteras, North Carolina **(Figure 2.1.7)**.

> **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.

This area represents existing North Atlantic right whale critical habitat in the South Atlantic region designated on June 3, 1994. The following is language describing the North Atlantic right whale critical habitat area from 50 CFR § 226.203(c) as designated on January 26, 2016:

> *Southeastern United States: Includes marine waters from Cape Fear, North Carolina, southward to 28°N latitude (approximately 31 miles south of Cape Canaveral, Florida) within the area bounded on the west by the shoreline and the 72 COLREGS lines, and on the east by rhumb lines connecting the following points in the order stated from north to south.*

Off North Carolina and South Carolina, the black sea bass pot closure applies in the exclusive economic zone in waters shallower than 25 m. 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 (North Carolina/South Carolina) to the northeastern corner waypoint of the southern section (Florida/Georgia).

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

> *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.*

Note: Federal regulations for **Alternative 7** would only apply to that portion of the area within the South Atlantic EEZ. The states would be asked to implement compatible regulations within state waters.

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

Point	N. Latitude	W Longitude	Point	N. Latitude	W Longitude
1	35° 15’	State/EEZ boundary	22	32° 56’	78° 57’
2	35° 15’	75° 09’	23	32° 44’	79° 04’
3	35° 06’	75° 22’	24	32° 42’	79° 13’
4	35° 06’	75° 39’	25	32° 34’	79° 23’
5	35° 01’	75° 47’	26	32° 25’	79° 25’
6	34° 54’	75° 46’	27	32° 23’	79° 37’
7	34° 52’	76° 04’	28	31° 53’	80° 09’
8	34° 33’	76° 22’	29	31° 15’	80° 59’
9	34° 23’	76° 18’	30	30° 56’	81° 05’
10	34° 21’	76° 27’	31	30° 42’	81° 07’
11	34° 25’	76° 51’	32	30° 15’	81° 05’
12	34° 09’	77° 19’	33	30° 15’	81° 17’
13	33° 44’	77° 38’	34	29° 40’	81° 07’
14	33° 25’	77° 27’	35	29° 08’	80° 51’
15	33° 22’	77° 40’	36	28° 36’	80° 28’
16	33° 28’	77° 41’	37	28° 26’	80° 25’
17	33° 32’	77° 53’	38	28° 20’	80° 31’
18	33° 22’	78° 26’	39	28° 11’	80° 30’
19	33° 06’	78° 31’	40	28° 00’	80° 25’
20	33° 05’	78° 40’	41	28° 00’	State/EEZ Boundary
21	33° 01’	78° 43’			

Source: Amanda Frick, NMFS SERO

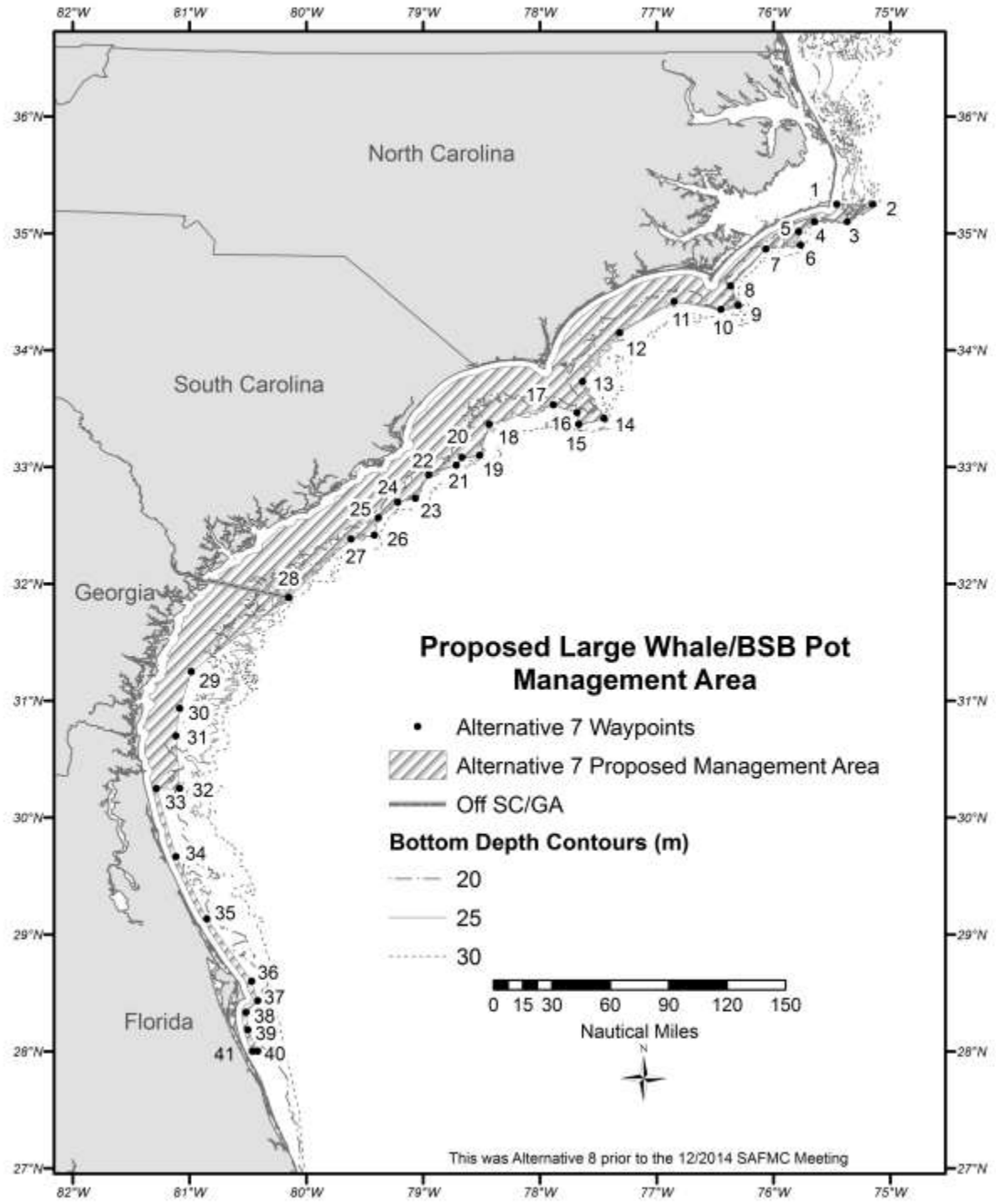

Figure 2.1.7. Area for the proposed black sea bass pot closure in **Alternative 7**.
Source: Amanda Frick, NMFS SERO

Alternative 8. The black sea bass pot closure applies to waters inshore of points 1-35 listed in **Table 2.1.6**; approximately Daytona Beach, Florida, to Cape Hatteras, North Carolina **(Figure 2.1.8)**.

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.

In **Alternative 8**, the boundaries off Florida and Georgia are nearly 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 m.

Note: Federal regulations for **Alternative 8** would only apply to that portion of the area within the South Atlantic EEZ. The states would be asked to implement compatible regulations within state waters.

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

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

Source: Amanda Frick, NMFS SERO

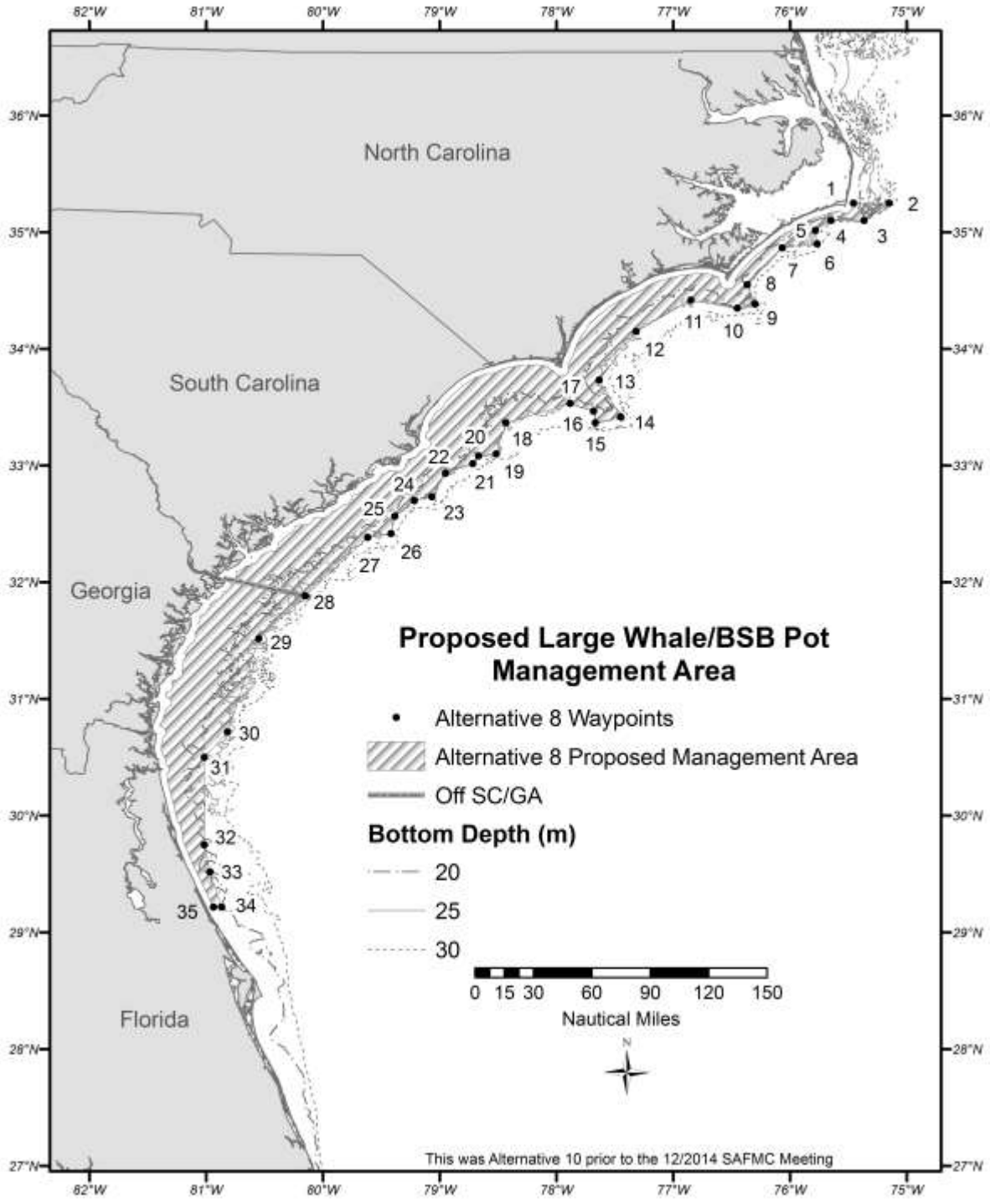

Figure 2.1.8. Area for the proposed black sea bass pot closure in **Alternative 8**.
Source: Amanda Frick, NMFS SERO

Alternative 9. The black sea bass pot closure applies to waters inshore of points 1-28 listed in **Table 2.1.7**; approximately Daytona Beach, Florida, to Cape Hatteras, North Carolina **(Figure 2.1.9)**.

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.

In **Alternative 9**, the boundaries off Florida and Georgia are nearly 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 m.

Note: Federal regulations for **Alternative 9** would only apply to that portion of the area within the South Atlantic EEZ. The states would be asked to implement compatible regulations within state waters.

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’
21	31° 42’	80° 24’
22	31º 31’	80º 33’
23	30º 43’	80º 49’
24	30º 30’	81º 01’
25	29º 45’	81º 01’
26	29º 31’	80º 58’
27	29º 13’	80º 52’
28	29º 13’	State/EEZ Boundary

Source: Amanda Frick, NMFS SERO

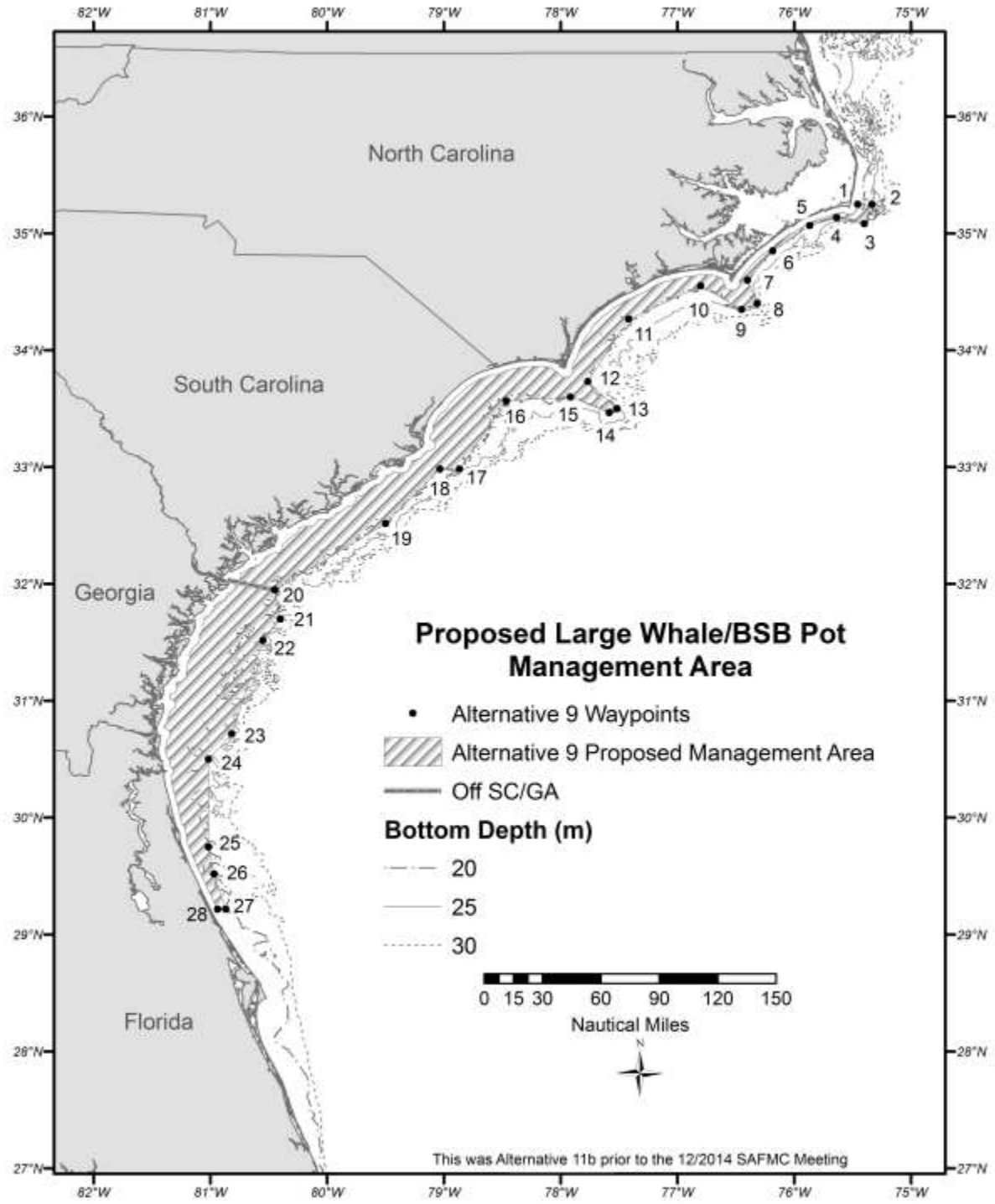

Figure 2.1.9. Area for the proposed black sea bass pot closure in **Alternative 9**.
Source: Amanda Frick, NMFS SERO

Alternative 10. From November 1 through December 15, the black sea bass pot closure applies to waters inshore of points 1-20 listed in **Table 2.1.8**; approximately Georgia/South Carolina State Line, to Cape Hatteras, North Carolina **(Figure 2.1.10).**

From February 15 through April 30, the black sea bass pot closure applies to waters inshore of points 1-28 listed in **Table 2.1.9**; approximately Georgia/South Carolina State Line, to Cape Hatteras, North Carolina **(Figure 2.1.11).**

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 in **Table 2.1.8**; approximately Georgia/South Carolina State Line, to approximately Daytona Beach, Florida **(Figure 2.1.10).**

In **Alternative 10**, the boundaries off Florida and Georgia are nearly 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 m from November 1 through December 15 and 25 m from February 15 through April 30.

Note: Federal regulations for **Alternative 10** would only apply to that portion of the area within the South Atlantic EEZ. The states would be asked to implement compatible regulations within state waters.

Table 2.1.8. Eastern boundary coordinates for the proposed black sea bass pot closure in **Alternative 10** for November 1 through December 15 (points 1-20), and November 15 through April 15 (points 20-28).

Point	N. Latitude	W. Longitude	Point	N. Latitude	W. Longitude
1	35° 15′	State/EEZ Boundary	15	33° 36’	77° 55’
2	35° 15’	75° 20’	16	33° 34’	78° 28’
3	35° 05’	75° 24’	17	32° 59’	78° 52’
4	35° 08’	75° 38’	18	32° 59’	79° 02’
5	35° 04’	75° 52’	19	32° 31’	79° 30’
6	34° ‘51’	76° 11’	20	31° 57’	80° 27’
7	34° 36’	76° 24’	21	31° 42’	80° 24’
8	34° 24’	76° 19’	22	31º 31’	80º 33’
9	34° 21’	76° 27’	23	30º 43’	80º 49’
10	34° 33’	76° 48’	24	30º 30’	81º 01’
11	34° 16’	77° 25’	25	29º 45’	81º 01’
12	33° 44’	77° 46’	26	29º 31’	80º 58’
13	33° 30’	77° 31’	27	29º 13’	80º 52’
14	33° 28’	77° 35’	28	29º 13’	State/EEZ Boundary

Source: Amanda Frick, NMFS SERO

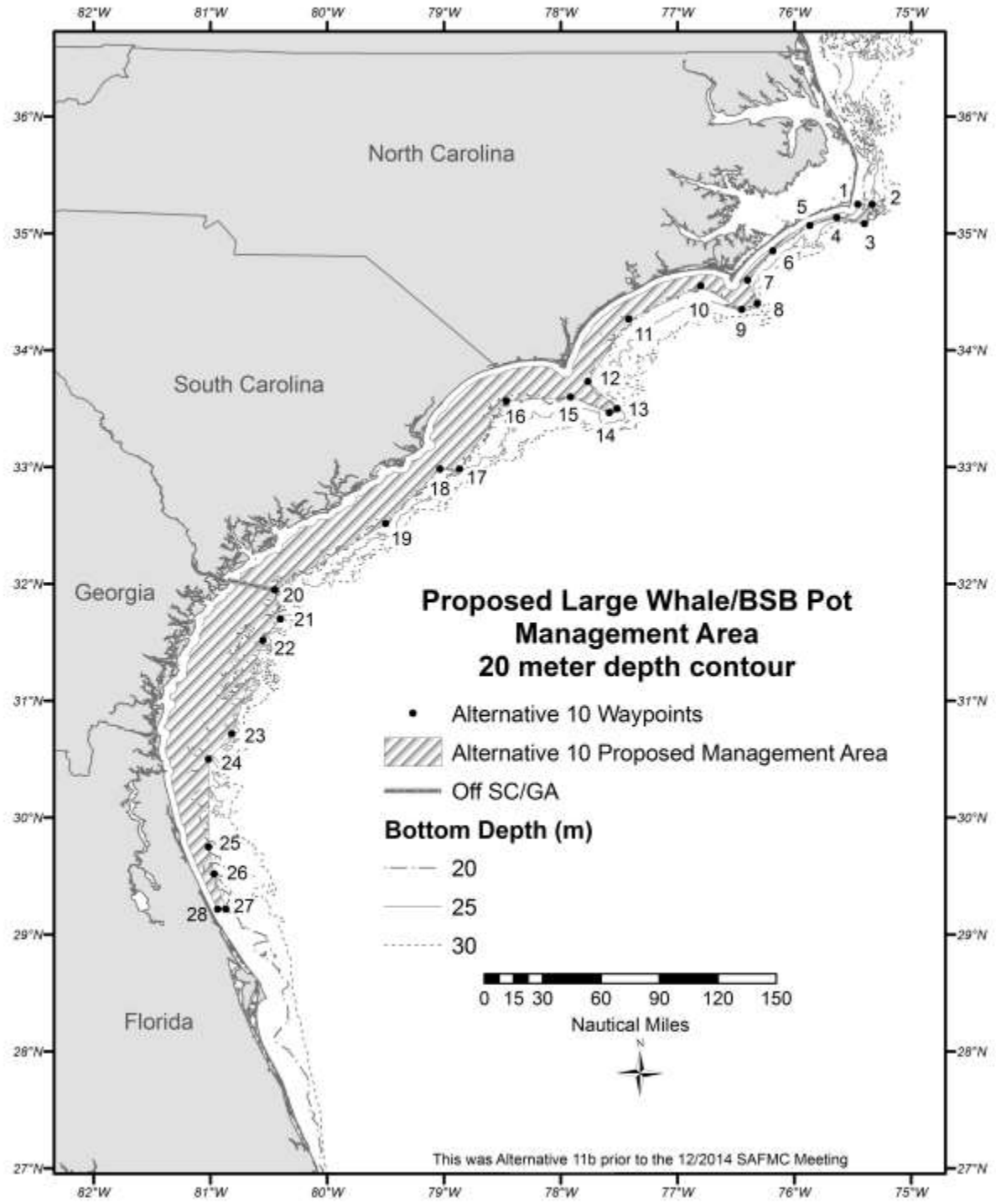

Figure 2.1.10. Area for the proposed black sea bass pot closure in **Alternative 10** from November 1 through December 15 (points 1-20), and November 15 through April 15 (points 20-28).
Source: Amanda Frick, NMFS SERO

Table 2.1.9. Eastern boundary coordinates for the proposed black sea bass pot closure in **Alternative 10** for February 15 through April 30.

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

Source: Amanda Frick, NMFS SERO

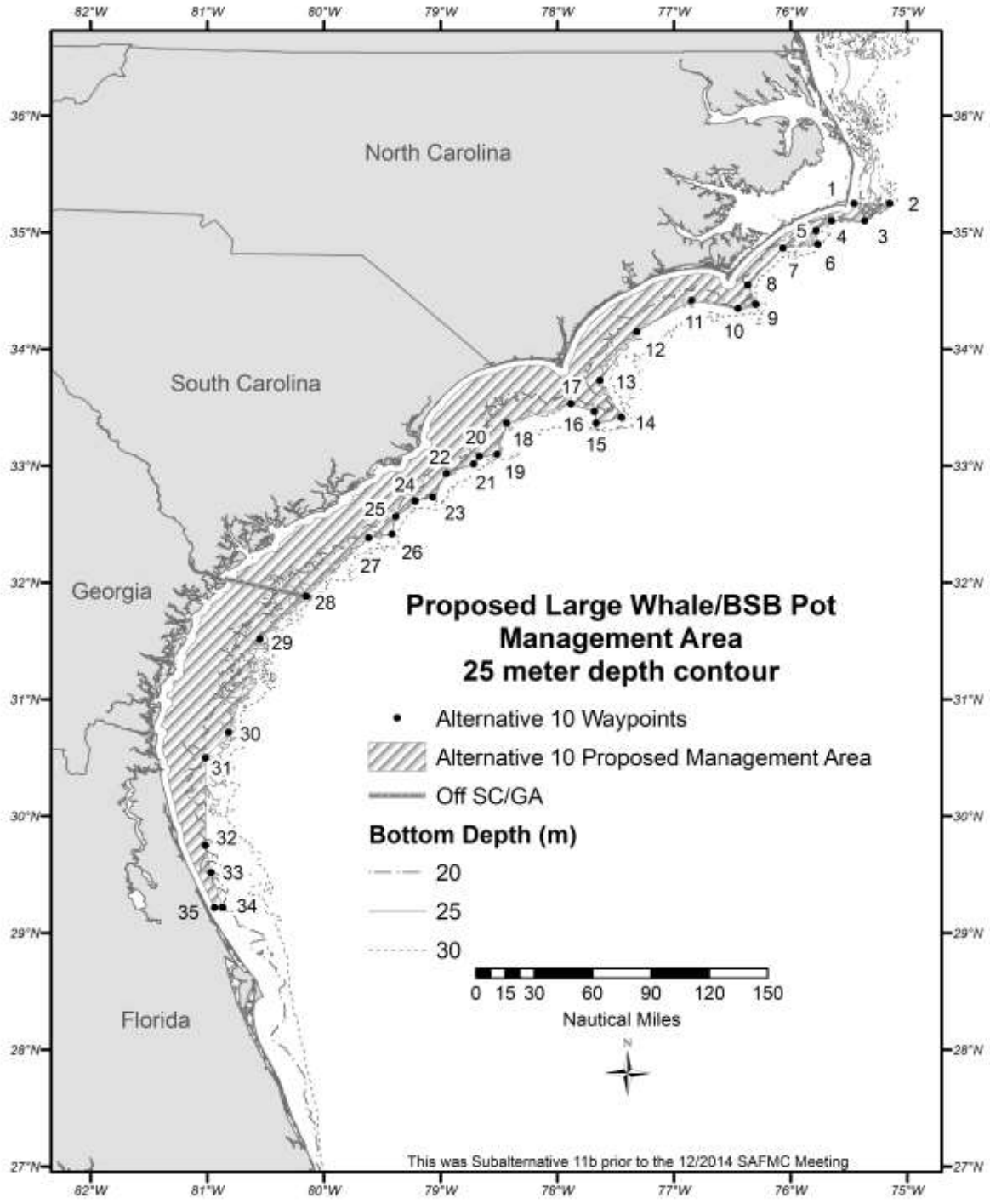

Figure 2.1.11. Area for the proposed black sea bass pot closure in **Alternative 10** from February 15 through April 30.
Source: Amanda Frick, NMFS SERO

Preferred Alternative 11. From November 1 through 30 and from April 1 through 30 each year, the black sea bass pot closure applies to waters inshore of points 1-35 listed in **Table 2.1.10**; approximately Daytona Beach, Florida, to Cape Hatteras, North Carolina **(Figure 2.1.12)**. From December 1 through March 31, the black sea bass pot closure applies to waters inshore of points 1-28 listed in **Table 2.1.11**; approximately Cape Canaveral, Florida, to Cape Hatteras, North Carolina **(Figure 2.1.13)**.

From November 1 through 30 and from April 1 through 30 each year, the boundaries off Florida and Georgia are nearly 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 m, corresponding with **Alternative 8**.

From December 1 through March 31, 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 and corresponds with **Alternative 4**. 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.

Note: Federal regulations for **Preferred Alternative 11** would only apply to that portion of the area within the South Atlantic EEZ. The states would be asked to implement compatible regulations within state waters.

Table 2.1.10. Eastern boundary coordinates for the proposed black sea bass pot closure in **Preferred Alternative 11** from November 1 through November 30 and April 1 through April 30.

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

Source: Amanda Frick, NMFS SERO

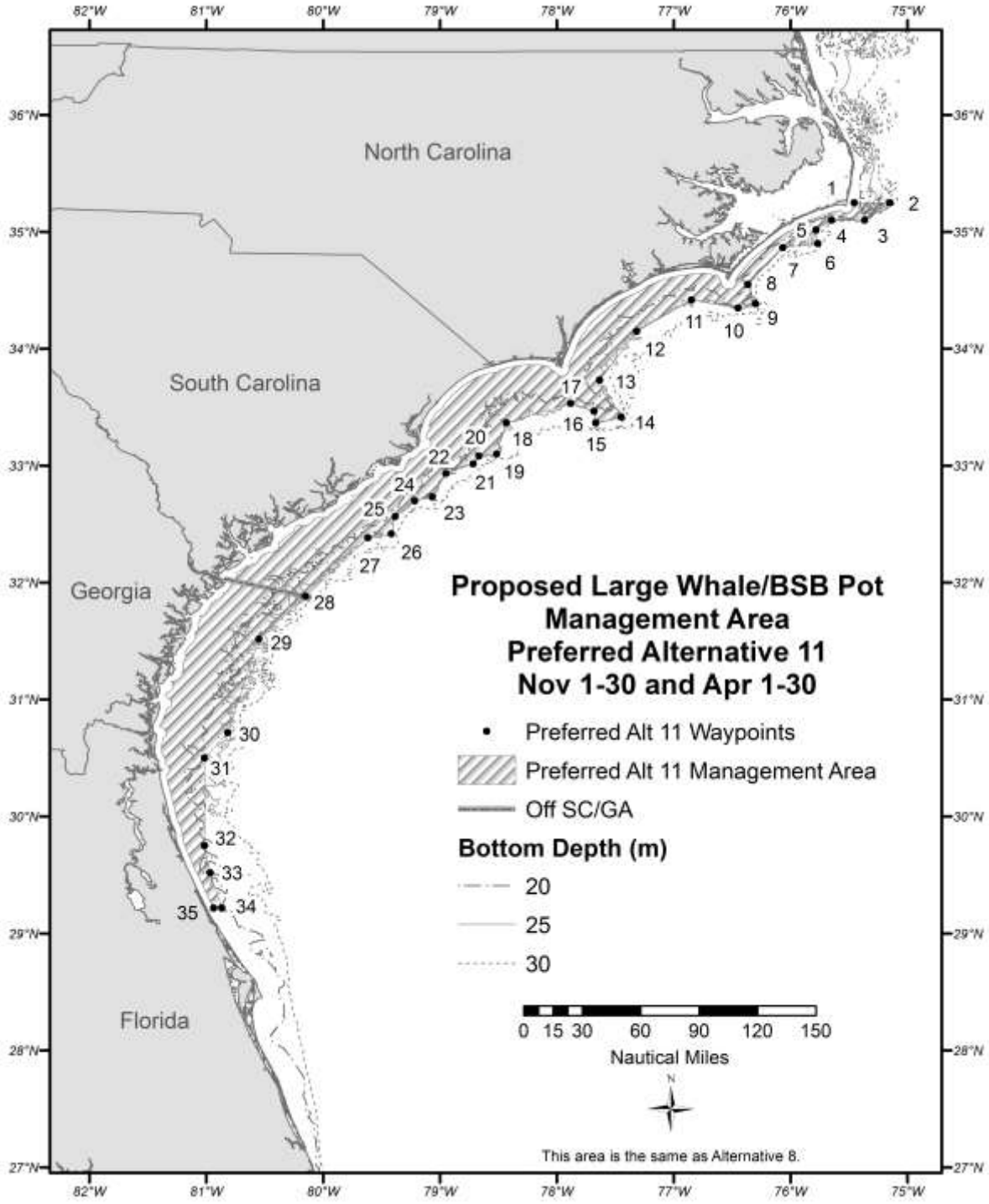

Figure 2.1.12. Area for the proposed black sea bass pot closure in **Preferred Alternative 11** from November 1 through November 30 and April 1 through April 30.
Source: Amanda Frick, NMFS SERO

Table 2.1.11. Eastern boundary coordinates for the proposed black sea bass pot closure in **Preferred Alternative 11** for December 1 through March 31.

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

Source: Amanda Frick, NMFS SERO

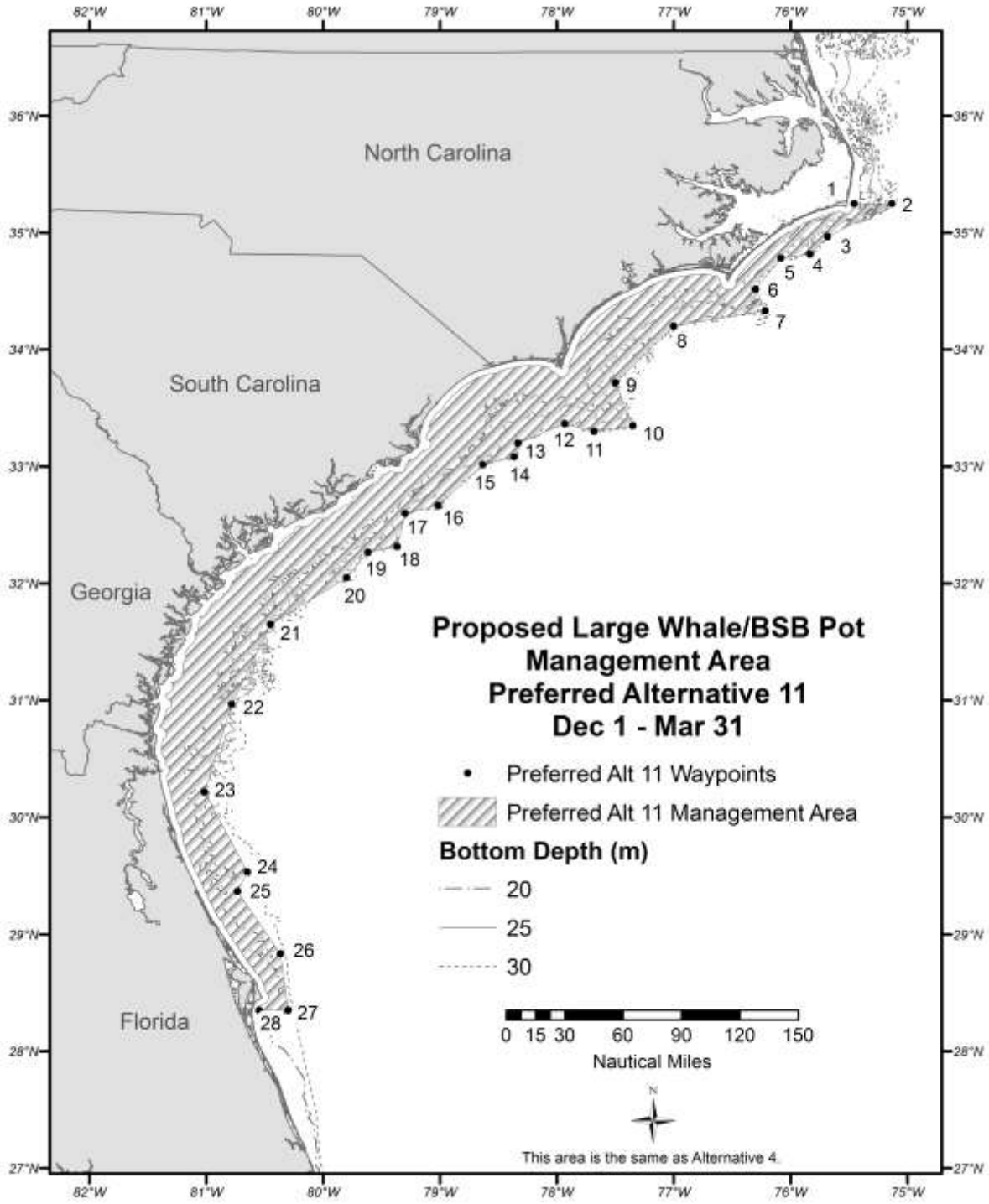

Figure 2.1.13. Area for the proposed black sea bass pot closure in **Preferred Alternative 11** from December 1 through March 31.
Source: Amanda Frick, NMFS SERO

Alternative 12. From November 1 through April 30, the black sea bass pot closure applies to waters inshore of points 1-31 listed in **Table 2.1.12**; approximately Cape Canaveral, Florida, to Cape Hatteras, North Carolina **(Figure 2.1.14)**.

This closure approximates the midpoints between proposed closure **Alternative 4** and **Sub-Alternative 8a**.

Note: Federal regulations for **Alternative 12** would only apply to that portion of the area within the South Atlantic EEZ. The states would be asked to implement compatible regulations within state waters.

Table 2.1.12. Eastern boundary coordinates for the proposed black sea bass pot closure in **Alternative 12** for November 1 through April 30.

Point	N. Latitude	W. Longitude	Point	N. Latitude	W. Longitude
1	35° 15’	State/EEZ Boundary	17	33° 05’	78° 26’
2	35° 15’	75° 09’	18	33° 03’	78° 39’
3	35° 06’	75° 22’	19	32° 42’	79° 03’
4	35° 04’	75° 38’	20	32° 37’	79° 18’
5	35° 00’	75° 44’	21	32° 22’	79° 23’
6	34° 54’	75° 46’	22	32° 20’	79° 36’
7	34° 51’	75° 50’	23	31° 31’	80° 32’
8	34° 50’	76° 04’	24	30° 43’	80° 49’
9	34° 32’	76° 20’	25	30° 30’	80° 58’
10	34° 21’	76° 15’	26	30° 13’	81° 01’
11	34° 15’	77° 04’	27	29° 32’	80° 49’
12	33° 43’	77° 34’	28	29° 13’	80° 46’
13	33° 23’	77° 24’	29	28° 37’	80° 20’
14	33° 20’	77° 41’	30	28° 21’	80° 18’
15	33° 27’	77° 54’	31	28° 21’	State/EEZ Boundary
16	33° 17’	78° 22’			

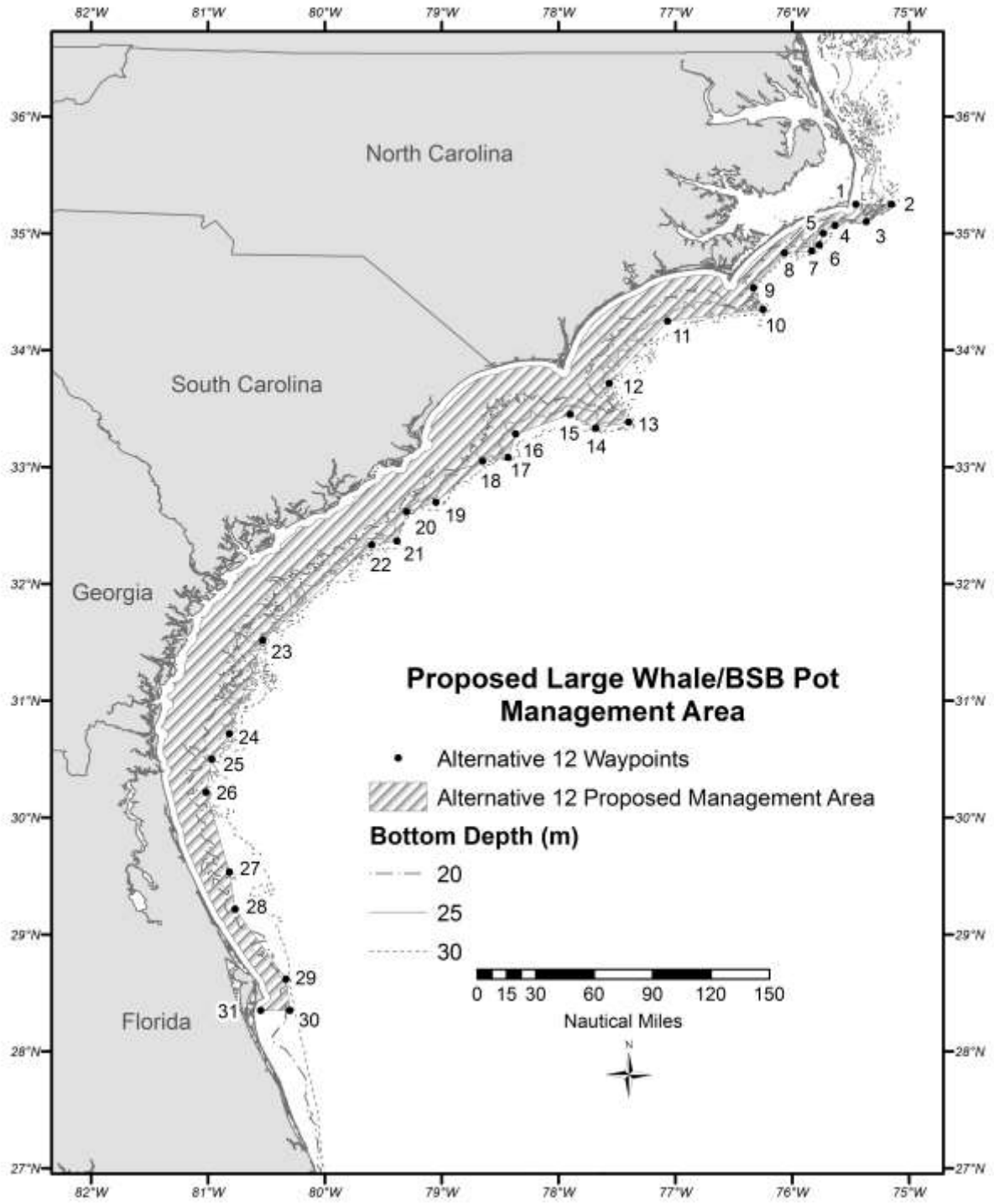

Figure 2.1.14. Area for the proposed black sea bass pot closure in **Alternative 12** from November 1 through April 30.
Source: Amanda Frick, NMFS SERO

2.1.2 Comparison of Alternatives

The attributes of the alternatives vary by alternatives **(Table 2.1.2.1)**. The comparison of the effects of the alternatives are in **Chapter 4**.

Table 2.1.2.1. The attributes of the alternatives for **Action 1.**

	Alternative Attributes				
	Area (mi^2)[1]	**Time period**	**Approximate Depth Contour as Eastern Edge (m)**		**Alternative Based On**
			NC/SC	**GA/FL**	
Alternative 1 (No Action)	148,141	Nov. 1-April 30	Variable		Entire EEZ
Alternative 2	2263	Nov. 15-April 15	Variable		Current right whale critical habitat
Alternative 3	12,203	Nov. 1-April 30	Variable		Models of calving grounds and sea temp/bathymetry
Alternative 4	17,377	Nov. 1-April 30	30	25	97%/96% whale sightings
Alternative 5	17,848	Nov. 1-April 30	30	Variable	Models of calving grounds and 75th percentile of sightings off FL & GA
Alternative 6	27,890	Nov. 1-April 30	30	Variable	Southeast seasonal gillnet restricted area and an additional area off NC
Sub-Alternative 7a	11,325	Nov. 1-Dec.15; March 15-April 30	25	Variable	Current right whale critical habitat; whale sightings
Sub-Alternative 7b	11,325	Nov. 1-Dec.15 (NC/SC); Nov. 15-April 15 (GA/FL)	25	Variable	
Sub-Alternative 7c	11,325	Feb. 15-April 30 (NC/SC); Nov. 15-April 15 (GA/FL)	25	Variable	
Sub-Alternative 8a	12,910	Nov. 1-April 15	25	Variable	75th percentile of sightings off FL & GA
Sub-Alternative 8b	12,910	Nov. 1-Dec. 15/Feb. 15-April 30 (NC/SC); Nov. 15-April 15 (GA/FL)	25	Variable	
Alternative 9a	9,951	Nov. 1-April 15	20	Variable	75th percentile of sightings off FL & GA
Alternative 9b	9,951	Nov. 1-Dec.15/Feb. 15-April 30 (NC & SC); Nov. 15-April 15 (GA & FL)	20	Variable	
Alternative 10	Varies	Nov. 1-Dec.15/Feb. 15-April 30 (NC & SC); Nov. 15-April 15 (GA & FL)	20 (first half) and 25 (second half)	Variable	75th percentile of sightings off FL & GA
Alternative 11 (Preferred)	Varies	Nov. 1-Nov. 30 (1) Dec. 1-March 31 (2) April 1- April 30 (3)	25 (30m Dec-Mar)	Variable (1) 25 (2) Variable (3)	97%/96% whale sightings, models of calving grounds, and 75th percentile of sightings off FL & GA
Alternative 12	15,648	Nov. 1-April 30	This closure approximates the midpoints between proposed closure **Alternative 4** and **Sub-alternative 8a**		

[1]Some alternatives extend south of the allowable black sea bass pot area and the area may be an overestimate.

Action 2. Enhance the existing Atlantic Large Whale Take Reduction Plan (ALWTRP) buoy line/weak link gear requirements and buoy line rope marking for black sea bass pots

2.2.1 Action 2 Alternatives

One or more actions beyond **Alternative 1 (No Action)** may be chosen.

Alternative 1 (No Action). Commercial black sea bass fishermen are required to abide by the pot configuration restrictions, pot escape mechanism requirements, and pot construction and escape mechanism requirements contained in 50 CFR § 622.189 (see discussion below). Additionally, commercial fishermen will continue to fish in compliance with existing buoy line and weak link gear requirements for black sea bass pots as required by the ALWTRP (50 CFR **§** 229.32).

Alternative 2. In addition to the requirements in 50 CFR § 622.189, enhance the current ALWTRP buoy line requirements from November 1 through April 30 in federal waters in the South Atlantic EEZ.

Sub-alternative 2a: The breaking strength must not exceed 2,200 lbs.

Sub-alternative 2b: The breaking line strength must not exceed 1,200 lbs.

Note: Fishermen could decide whether they would want to use the same buoy line from May 1 through October 31.

Alternative 3. In addition to the requirements in 50 CFR § 622.189, enhance the current ALWTRP weak link requirements. From November 1 to April 30, the breaking strength of the weak links must not exceed 400 pounds for black sea bass pots in the South Atlantic EEZ.

Note: Fishermen could decide whether they would want to use the same weak link strength from May 1 through October 31.

Preferred Alternative 4. In addition to the requirements in 50 CFR § 622.189, enhance the current ALWTRP gear marking requirements. In addition to the ALWTRP's rope marking requirements, include a feature to specifically distinguish the commercial South Atlantic black sea bass pot component of the snapper grouper fishery. Currently the ALWTRP requires three 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 are deployed. This alternative will require an additional 12-inch wide purple band be added at the end of each required 12-inch colored mark. Each of the three marks would be a total of 24 inches in length. The additional gear marking requirements of this action are required in federal waters from November 15 through April 15 (Southeast Restricted Area North), September 1 through May 31 (Offshore Trap/Pot Area), and September 1 through May 31 (Southern Nearshore Trap/Pot Waters Area).

Action 2 Discussion

50 CFR § 622.189 Restrictions and requirements for sea bass pots.

(a) *Tending restriction*. A sea bass pot in the South Atlantic EEZ may be pulled or tended only by a person (other than an authorized officer) aboard the vessel permitted to fish such pot or aboard another vessel if such vessel has on board written consent of the owner or operator of the vessel so permitted.

(b) *Configuration restriction*. In the South Atlantic EEZ, sea bass pots may not be used or possessed in multiple configurations, that is, two or more pots may not be attached one to another so that their overall dimensions exceed those allowed for an individual sea bass pot. This does not preclude connecting individual pots to a line, such as a "trawl" or trot line.

(c) *Requirement for escape mechanisms*. (1) A sea bass pot that is used or possessed in the South Atlantic EEZ 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) is required to have--

(i) On at least one side, excluding top and bottom, a panel or door with an opening equal to or larger than the interior end of the trap's throat (funnel). The hinges and fasteners of each panel or door must be made of one of the following degradable materials:

(A) Ungalvanized or uncoated iron wire with a diameter not exceeding 0.041 inches (1.0 mm), that is, 19 gauge wire.

(B) Galvanic timed-release mechanisms with a letter grade designation (degradability index) no higher than J.

(ii) An unobstructed escape vent opening on at least two opposite vertical sides, excluding top and bottom. The minimum dimensions of an escape vent opening (based on inside measurement) are:

(A) 1 1/8 by 5 3/4 inches (2.9 by 14.6 cm) for a rectangular vent.

(B) 1.75 by 1.75 inches (4.5 by 4.5 cm) for a square vent.

(C) 2.0-inch (5.1-cm) diameter for a round vent.

(2) [Reserved]

(d) *Construction requirements and mesh sizes*. (1) A sea bass pot used or possessed in the South Atlantic EEZ must have mesh sizes as follows (based on centerline measurements between opposite, parallel wires or netting strands):

(i) For sides of the pot other than the back panel:

(A) Hexagonal mesh (chicken wire)--at least 1.5 inches (3.8 cm) between the wrapped sides;

(B) Square mesh--at least 1.5 inches (3.8 cm) between sides; or

(C) Rectangular mesh--at least 1 inch (2.5 cm) between the longer sides and 2 inches (5.1 cm) between the shorter sides.

(ii) For the entire back panel, *i.e.*, the side of the pot opposite the side that contains the pot entrance, mesh that is at least 2 inches (5.1 cm) between sides.

(2) [Reserved]

(e) *Requirements for pot removal*. (1) A sea bass pot must be removed from the water in the South Atlantic EEZ and the vessel must be returned to a dock, berth, beach, seawall, or ramp at the conclusion of each trip. Sea bass pots may remain on the vessel at the conclusion of each trip.

(2) A sea bass pot must be removed from the water in the South Atlantic EEZ when the applicable quota specified in § 622.190(a)(5) is reached. After a closure is in effect, a black sea bass may not be retained by a vessel that has a sea bass pot on board.

(f) *Restriction on number of pots*. A vessel that has on board a valid Federal commercial permit for South Atlantic snapper-grouper and a South Atlantic black sea bass pot endorsement that fishes in the South Atlantic EEZ on a trip with black sea bass pots, may possess only 35 black sea bass pots per vessel per permit year. Each black sea bass pot in the water or onboard a vessel in the South Atlantic EEZ, must have a valid identification tag attached. Endorsement holders must apply for new tags each permit year through NMFS to replace tags from the previous year.

2.2.2 Comparison of Alternatives

The attributes of the alternatives vary by alternatives **(Table 2.2.2.1)**. The comparison of the effects of the alternatives are in **Chapter 4**.

Table 2.2.2.1. The attributes of the alternatives for **Action 2**.

	Alternative Attributes		
	Buoy line breaking strength	**Weak link breaking strength**	**Buoy line rope marking**
Alternative 1 (No Action)		From November 15 through April 15, in specified areas, weak link strength must not exceed 200 and 400 pounds off Florida and South Carolina/Georgia, respectively	Three 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 are deployed
Sub-Alternative 2a	In addition to the requirements under **Alternative 1 (no action)**, the buoy line breaking strength must not exceed 2,200 pounds from November 1 through April 30 in federal waters in the South Atlantic EEZ.	n/a	n/a
Sub-Alternative 2b	In addition to the requirements under **Alternative 1 (no action)**, the buoy line breaking strength must not exceed 1,200 pounds from November 1 through April 30 in federal waters in the South Atlantic EEZ.	n/a	n/a
Alternative 3	n/a	In addition to the requirements under **Alternative 1 (no action)**, from November 1 to April 30, the breaking strength of the weak links must not exceed 400 pounds for black sea bass pots in the South Atlantic EEZ	n/a
Alternative 4 (Preferred)	n/a	n/a	In addition to the requirements under **Alternative 1 (no action)**, require an additional 12-inch wide purple band be added at the end of each required 12-inch colored mark. The additional gear marking requirements of this action are required in federal waters from November 15 through April 15 (Southeast Restricted Area North), September 1 through May 31 (Offshore Trap/Pot Area), and September 1 through May 31 (Southern Nearshore Trap/Pot Waters Area).

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; McCartney and Burton 2011). 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. 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 2000. 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**).

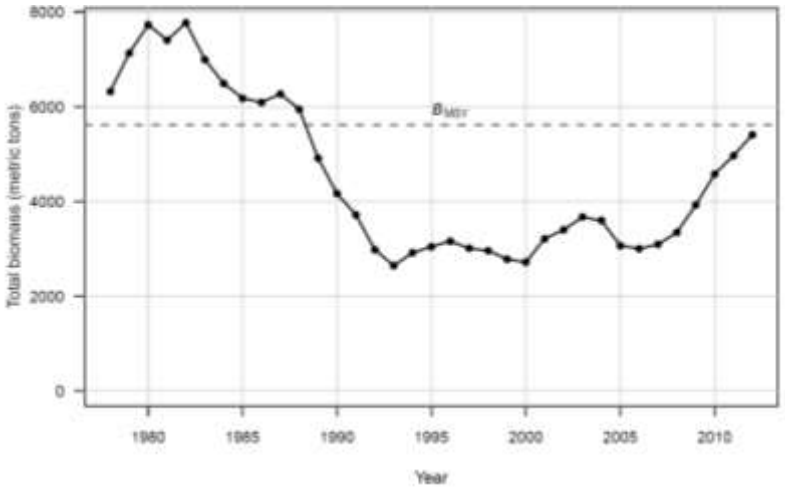

Figure 3.2.1. Estimated total biomass (metric tons) at start of year Source: SEDAR 25 Update 2013)

Prior to the recent increase in commercial ACL for black sea bass, the commercial ACL was exceeded every year but one (2007-2008) (**Table 3.2.1**).

Table 3.2.1. Commercial landings in relation to the commercial ACL.

Fishing Year	Fishing Season	Total Landings	ACL/Quota	Units	Quota %	Closure Date
2014	June 1 - Dec 31	212,435	780,020	ww	27.23	
2013-2014	June 1 - May 31	776,723	780,020	ww	99.58	
2012-2013	July* 1 - May 31	383,292	309,000	gw	124.04	10/08/2012
2011-2012	June 1 - May 31	385,639	309,000	gw	124.80	7/15/2011
2010-2011		436,360	309,000	gw	144.22	10/7/2010
2009-2010		336,735	309,000	gw	108.98	12/20/2009
2008-2009		394,708	309,000	gw	127.74	5/15/2009
2007-2008		298,917	423,000	gw	70.67	

*The black sea bass fishing season opening was pushed back to July 1 for the 2012-2013 fishing season.

Bycatch

See **Section 4.1.1** and the **Bycatch Practicability Analysis (Appendix F)** for detail descriptions of bycatch when fishing for black sea bass.

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. 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. 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 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. 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. Although a 2010 strong year class was identified, more recent data than 2010 were used in the analysis

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 49 species, or distinct population segments (DPSs) of species, protected by federal law that may occur in the exclusive economic zone (EEZ) of the South Atlantic Region (Wynne and Schwartz 1999; Waring et al. 2013). Thirty-one of these species are marine mammals protected under the Marine Mammal Protection Act (MMPA). The MMPA requires that each commercial fishery be classified by the number of marine mammals they seriously injure or kill. NMFS's List of Fisheries (LOF) classifies U.S. commercial fisheries with analogous gear types into three categories based on the number of incidental mortality or serious injury they cause to marine mammals. More information about the LOF and the classification process can be found at: http://www.nmfs.noaa.gov/pr/interactions/lof/. Six of the marine mammal species (sperm, sei, fin, blue, humpback, and North Atlantic right whales) protected by the MMPA, 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 DPSs of Atlantic sturgeon; and seven species of coral (elkhorn coral [*Acropora palmata*], staghorn coral [*A. cervicornis*] ("*Acropora*" collectively); lobed star coral [*Orbicella annularis*], mountainous star coral [*O. faveolata*], and boulder star coral [*O. franksi*] ("*Orbicella*" collectively); pillar coral [*Dendrogyra cylindrus*] and rough cactus coral [*Mycetophyllia ferox*]) are also protected under the ESA. Portions of designated critical habitat for North Atlantic right whales, the Northwest Atlantic (NWA) DPS of loggerhead sea turtles, and *Acropora* corals occur within the South Atlantic Council's jurisdiction. NMFS has conducted specific analyses ("Section 7 consultations") to evaluate the potential adverse effects from the South Atlantic Snapper Grouper Fishery on species and critical habitat protected under the ESA. Because of Regulatory Amendment 16'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. 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). 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 a single 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 a 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).

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 North Atlantic right whales 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 North Atlantic Right Whale's low reproductive output and small population size, even low levels of human-caused mortality can pose a significant obstacle for their 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 455 and the maximum net productivity is 0.04; thus, PBR for the North Atlantic right whale is 0.9 (Waring et al. 2013). This means that if more than a single (because 1.0 is > 0.9) right whale is killed or seriously injured from non-natural causes in a single year, than the population cannot achieve its optimum sustainable population.

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 not recovered. 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. 2004; 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. 2004; 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 (e.g., trap, pot and gillnet 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 some entanglements are undocumented or unreported and it is likely that carcasses from offshore are not detected or recovered (Cole et al. 2005). 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) examined 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). In a recent compilation of data from 2007-2014, there were 17 entangled whales and none of these were attributed to a specific fishery (Waring et al. 2014). As evidenced by these compilations, information from an entanglement event often does not include the detail necessary to assign the entanglements to a particular fishery or location, and scarring studies suggest the vast majority of entanglements are not observed (Waring et al. 2014).

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). Right whale calves would likely need a line breaking strength of 600 lbs or lighter in order to have some chance of breaking free (Knowlton et al. 2015)

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 2008 through 2012, there were at least 7 reports of mortalities as a result of collision with a vessel and 41 serious injuries and mortalities attributed to entanglement (80 FR 4881; January 29, 2015). 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 (57%) buoy line entanglements involved the mouth.[1] In addition, 5 out of 7 (71%) buoy line entanglements and 3 out of 4 (75%) 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, 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

[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).

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.) 2002).

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

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

Kemp's ridley hatchlings are also pelagic during the early stages of life and feed in surface waters (Carr 1987, Ogren 1989). Once the juveniles reach approximately 20 cm carapace length

they move to relatively shallow (less than 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 (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 1987). 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 currently 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. This area was originally based on 303 sightings from 1950-1989. All 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. On February 20, 2015, NMFS published the proposed rule outlined the proposed changes to North Atlantic right whale critical habitat, available at: 80 FR 9314.

The following is language describing the North Atlantic right whale critical habitat area from 50 CFR § 226.203(c) as designated on January 26, 2016:

> *Southeastern United States: Includes marine waters from Cape Fear, North Carolina, southward to 28°N latitude (approximately 31 miles south of Cape Canaveral, Florida) within the area bounded on the west by the shoreline and the 72 COLREGS lines, and on the east by rhumb lines connecting the following points in the order stated from north to south.*

N. Latitude	**W. Longitude**
33°51’ N	at shoreline
33°42’ N	77°43’ W
33°37’ N	77°47’ W
33°28’ N	78°33’ W
32°59’ N	78°50’ W
32°17’ N	79°53’ W
31°31’ N	80°33’ W
30°43’ N	80°49’ W
30°30’ N	81°01’ W
29°45’ N	81°01’ W
29°15’ N	80º55’ W
29°08’ N	80°51’ W
28°50’ N	80°39’ W
28°38’ N	80°30’ W
28°28’ N	80°26’ W
28°24’ N	80°27’ W
28°21’ N	80°31’ W
28°16’ N	80°31’ W
28°11’ N	80°33’ W
28°00’ N	80º29’ W
28°00’ N	At shoreline

3.3 Social and Economic 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 (gutted weight; 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 crab 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**). Whenever a new entrant enters the fishery, two existing South Atlantic Snapper Grouper Unlimited Permits must be purchased and one is then permanently retired as a means of reducing the number of permits available. For harvesting black sea bass using pots, 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 (SAFMC 2012).

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-2014-09, 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 2013b)] .

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 the commercial 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, pots 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 pots also substantially increased in the 2013/14 fishing season.

In **Table 3.3.1.3**, the other gear category includes dredges, hand, gigs and spears, gillnets, lift nets, trap nets, unclassified, and diving. Each of these other gear, with the exception of "unclassified gear," accounted for less than one percent of total black sea bass landings for the entire period. Unclassified landings accounted for approximately 7 percent of all landings by "other gear" for the entire period. Since the 2008/2009 fishing year, however, "unclassified

gear" accounted for 99 percent to 100 percent of total landings by other gear types. Landings information using logbooks (see **Table 3.3.1.7** below) indicates that most of the unclassified landings cannot be assigned to the pot gear. Based on the history of landings by other gear, particularly before the 2008/09 fishing season, it is likely that a good part of unclassified landings are by hook and line gear.

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.

	Total	Pots	Hook and Line	Others
Landings (lb gw)				
2000/01	470,412	79.1%	17.4%	3.6%
2001/02	491,204	83.4%	14.5%	2.1%
2002/03	341,092	80.8%	17.7%	1.5%
2003/04	676,227	84.2%	14.1%	1.7%
2004/05	541,550	82.8%	17.0%	0.2%
2005/06	342,636	84.8%	15.0%	0.1%
2006/07	458,439	86.8%	12.9%	0.3%
2007/08	298,917	81.4%	18.2%	0.4%
2008/09	394,708	68.0%	11.3%	20.7%
2009/10	336,735	70.2%	15.6%	14.3%
2010/11	436,360	66.4%	11.9%	21.7%
2011/12	385,639	61.0%	10.4%	28.6%
2012/13	383,292	46.6%	21.8%	31.6%
Average	427,478	75.8%	15.1%	9.1%
Revenues (2013 $)				
2000/01	$1,122,137	77.1%	19.9%	3.0%
2001/02	$1,095,327	81.4%	16.3%	2.3%
2002/03	$744,893	79.0%	19.2%	1.7%
2003/04	$1,490,984	83.1%	15.2%	1.7%
2004/05	$1,195,576	81.1%	18.6%	0.2%
2005/06	$876,038	83.7%	16.1%	0.1%
2006/07	$1,259,167	85.6%	14.1%	0.3%
2007/08	$811,005	80.3%	19.4%	0.3%
2008/09	$1,017,498	67.1%	12.7%	20.2%
2009/10	$860,831	66.2%	16.4%	17.3%
2010/11	$1,168,691	63.5%	11.6%	24.8%
2011/12	$864,484	54.4%	11.9%	33.7%
2012/13	$1,104,440	44.3%	23.0%	32.7%
Average	$1,047,005	73.3%	16.4%	10.3%

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.

	Total	Florida/Georgia	South Carolina	North Carolina
Landings (lb gw)				
2000/01	470,412	1.1%	18.8%	80.1%
2001/02	491,204	1.7%	10.4%	88.0%
2002/03	341,092	1.8%	12.1%	86.0%
2003/04	676,227	1.5%	29.1%	69.4%
2004/05	541,550	2.5%	22.0%	75.5%
2005/06	342,636	2.1%	18.9%	79.0%
2006/07	458,439	2.2%	22.0%	75.8%
2007/08	298,917	2.5%	35.1%	62.3%
2008/09	394,708	2.2%	28.7%	69.1%
2009/10	336,735	12.1%	17.9%	70.0%
2010/11	436,360	17.9%	19.0%	63.1%
2011/12	385,639	29.6%	21.9%	48.5%
2012/13	383,292	15.9%	26.0%	58.1%
Average	427,478	6.7%	21.7%	71.6%
Revenues (2013 $)				
2000/01	$1,122,137	0.8%	18.2%	81.0%
2001/02	$1,095,327	1.4%	11.1%	87.5%
2002/03	$744,893	1.7%	14.2%	84.1%
2003/04	$1,490,984	1.5%	29.0%	69.5%
2004/05	$1,195,576	2.5%	22.5%	75.1%
2005/06	$876,038	2.0%	20.1%	77.9%
2006/07	$1,259,167	2.1%	22.6%	75.3%
2007/08	$811,005	2.3%	33.3%	64.4%
2008/09	$1,017,498	2.1%	28.0%	69.8%
2009/10	$860,831	10.7%	21.4%	67.8%
2010/11	$1,168,691	13.3%	19.3%	67.4%
2011/12	$864,484	19.7%	21.8%	58.5%
2012/13	$1,104,440	12.0%	27.8%	60.2%
Average	$1,047,005	5.3%	22.4%	72.2%

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.

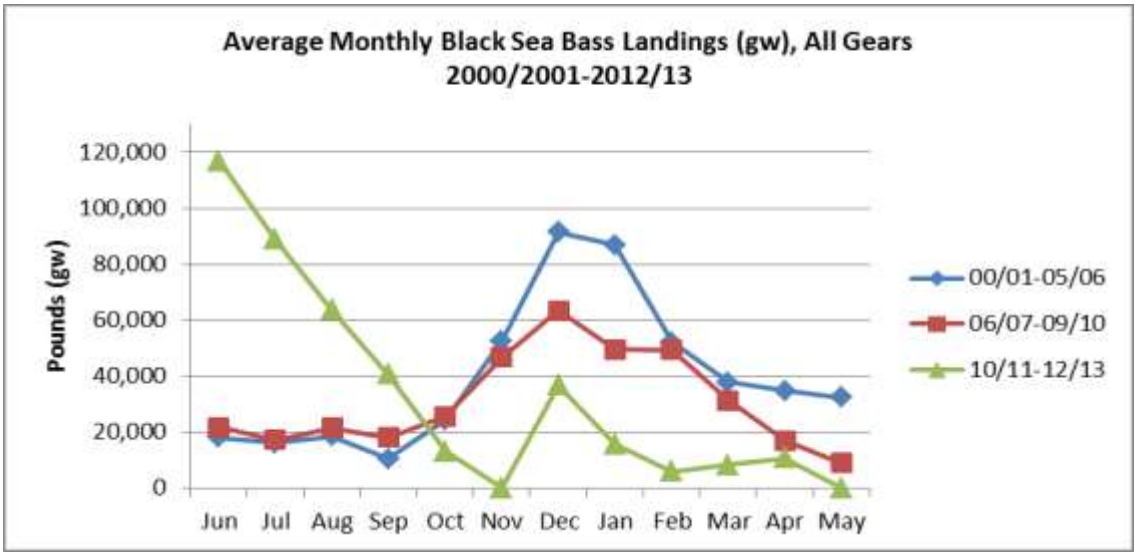

Figure 3.3.1.1. Average monthly black sea bass landings (lb gw) by all gear for fishing years 2000/01-2012/13.
Source: SEFSC Commercial ACL Dataset, ACL_Tables_07102014

The seasonality pattern for, and the level of, black sea bass landings by pots 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 pots have been the dominant gear type for black sea bass commercial landings.

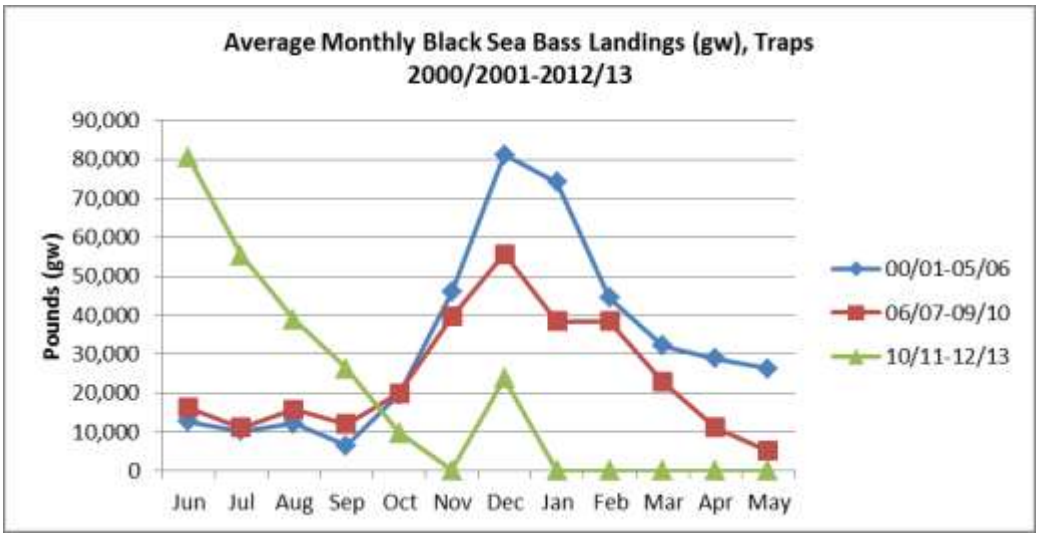

Figure 3.3.1.2. Average monthly black sea bass landings (lb gw) by pots for fishing years 2000/01-2012/13.
Source: SEFSC Commercial ACL Dataset, ACL_Tables_07102014

The seasonality pattern for landings by other, non-pot gear (**Figure 3.3.1.3**)is quite different from that for landings by all gear types (**Figure 3.3.1.1**). 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 pot 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.

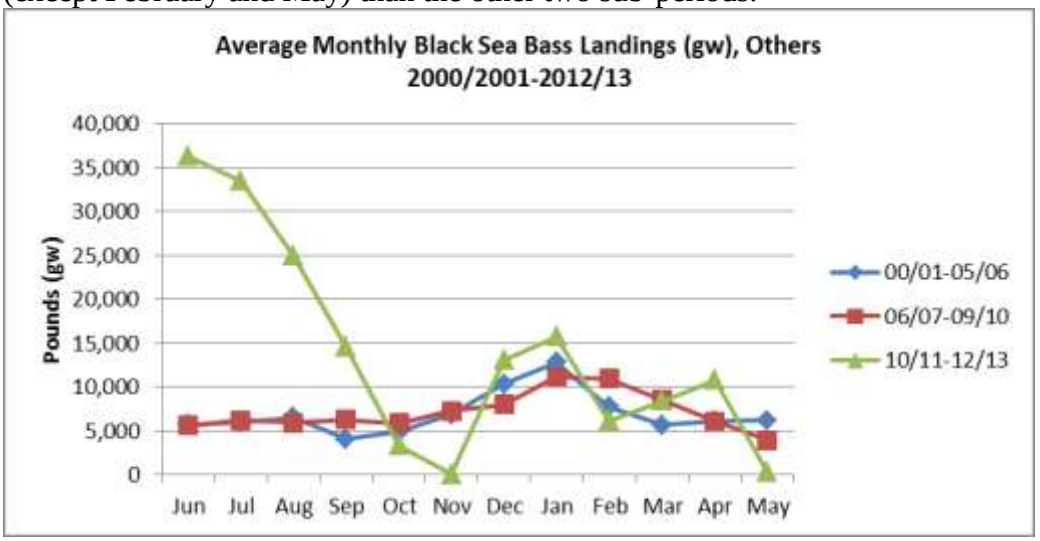

Figure 3.3.1.3. Average monthly black sea bass landings (lb gw) by other gear for fishing years 2000/01-2012/13.
Source: SEFSC Commercial ACL Dataset, ACL_Tables_07102014

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 3.3.1.4**). 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.

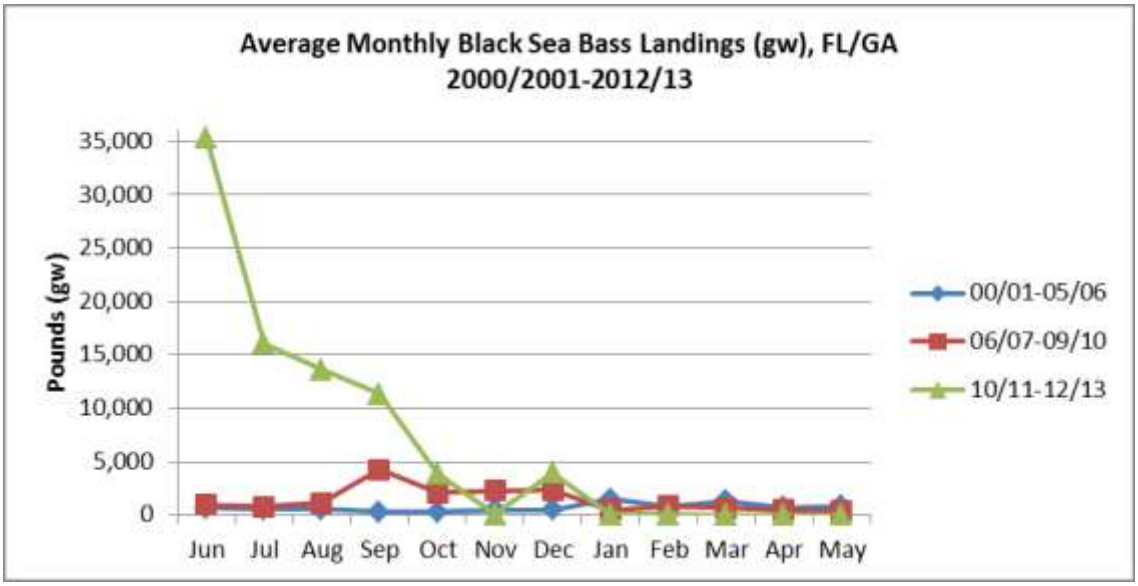

Figure 3.3.1.4. Average monthly FL/GA black sea bass landings (lb gw), fishing years 2000/01-2012/13. Source: SEFSC Commercial ACL Dataset, ACL_Tables_07102014

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 pots only.

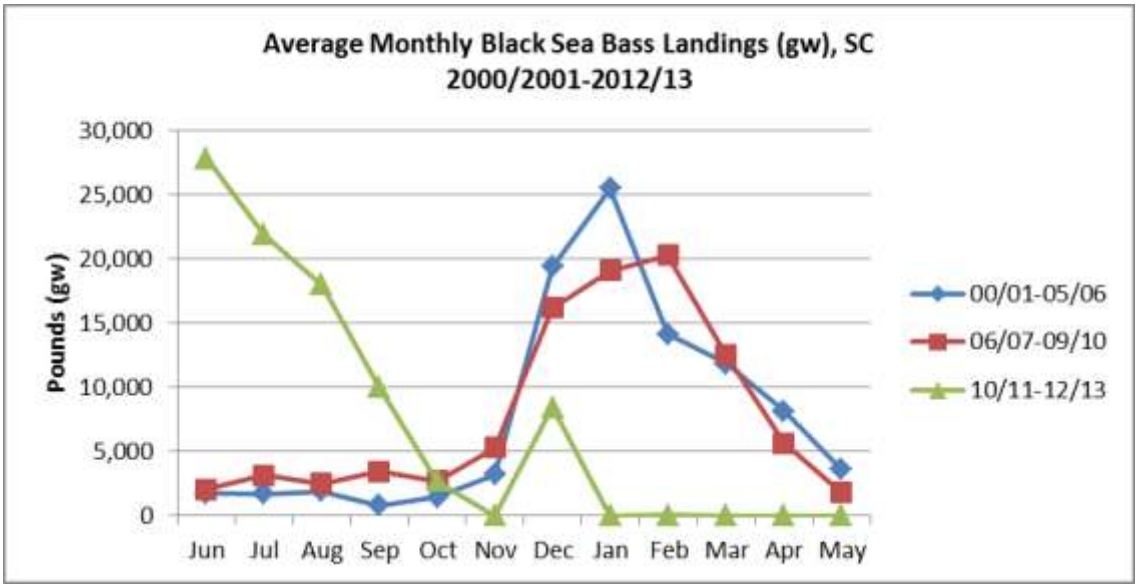

Figure 3.3.1.5. Average monthly SC black sea bass landings (lb gw), fishing years 2000/01-2012/13.
Source: SEFSC Commercial ACL Dataset, ACL_Tables_07102014

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.

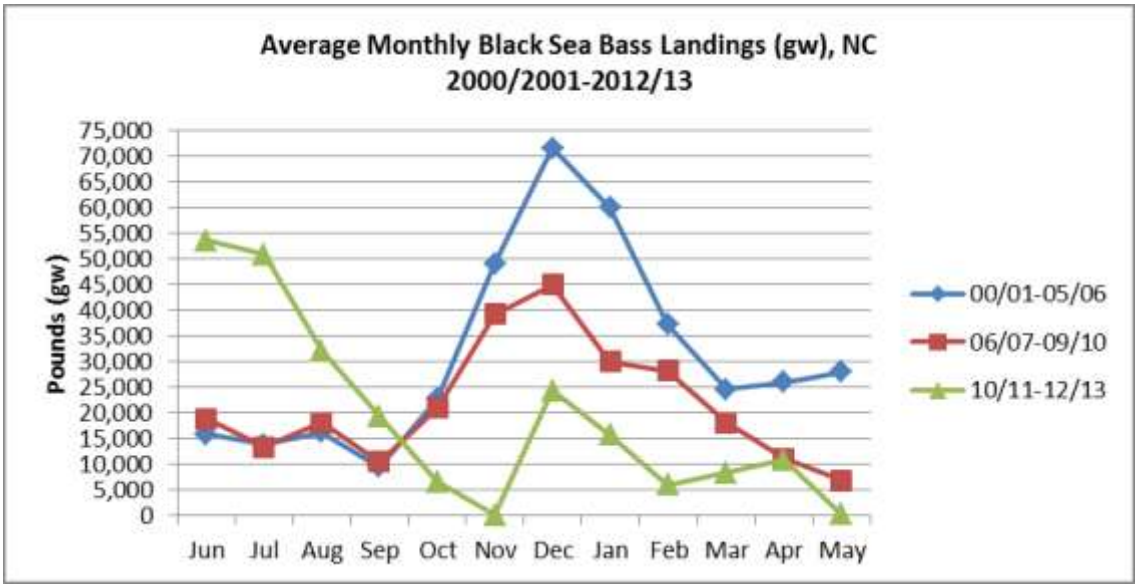

Figure 3.3.1.6. Average monthly NC black sea bass landings (lb gw), fishing years 2000/01-2012/13.
Source: SEFSC Commercial ACL Dataset, ACL_Tables_07102014

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.

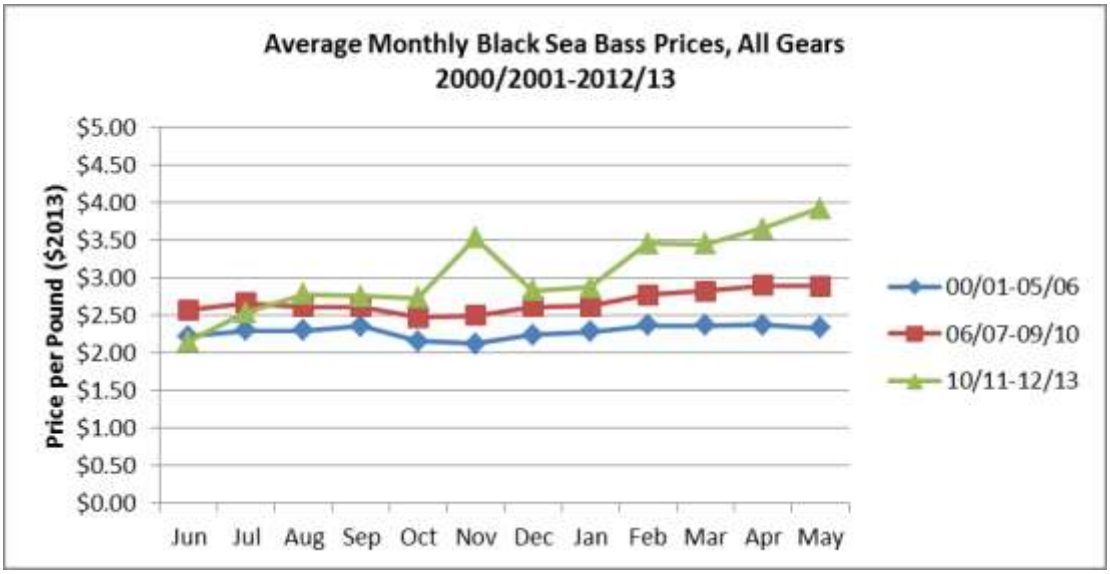

Figure 3.3.1.7. Average monthly black sea bass prices (2013 $) by all types for gear fishing years 2000/01-2012/13.
Source: SEFSC Commercial ACL Dataset, ACL_Tables_07102014

The price pattern for pot landings closely mimics that for landings by all gear types, except that there are not reported prices for pot landings from January through May due to zero pot 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 pots is almost as expected because pots are the predominant gear in harvesting black sea bass. The absence of pot 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.

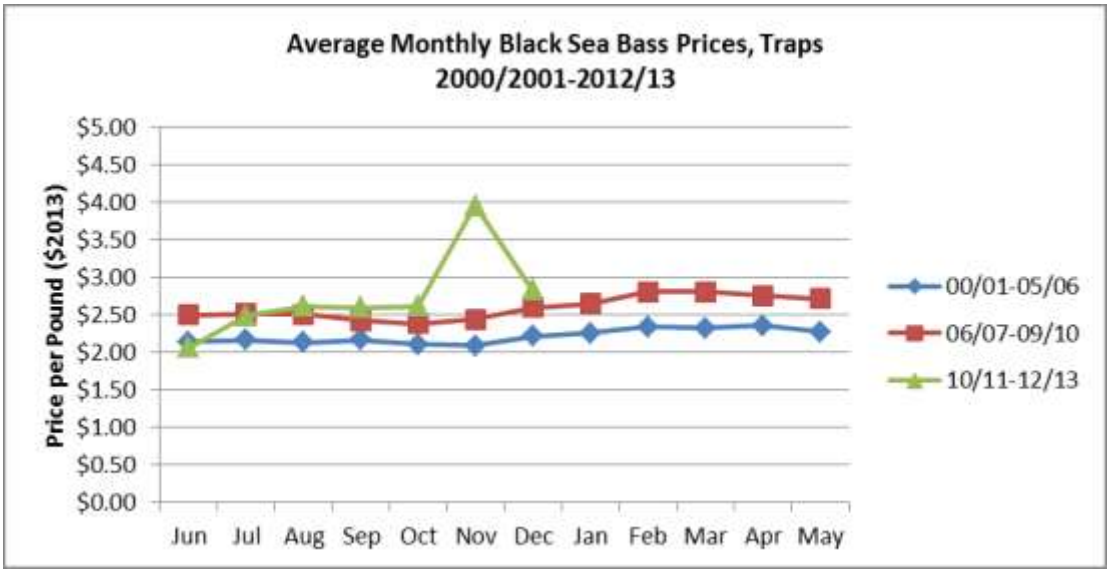

Figure 3.3.1.8. Average monthly black sea bass prices (2013 $) by pots for fishing years 2000/01-2012/13.
Source: SEFSC Commercial ACL Dataset, ACL_Tables_07102014

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 pot 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.

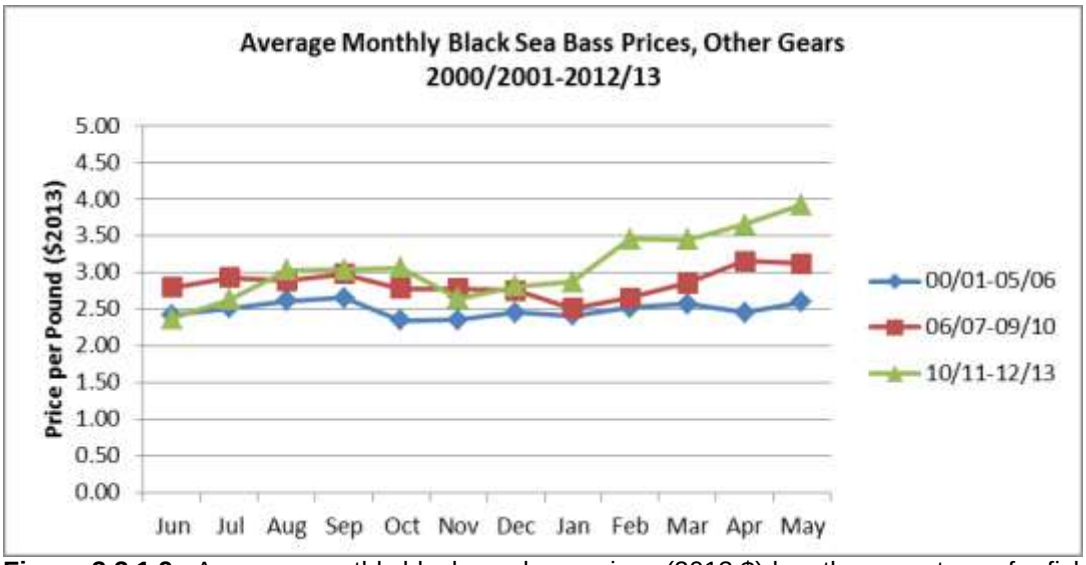

Figure 3.3.1.9. Average monthly black sea bass prices (2013 $) by other gear types for fishing years 2000/01-2012/13.
Source: SEFSC Commercial ACL Dataset, ACL_Tables_07102014

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.

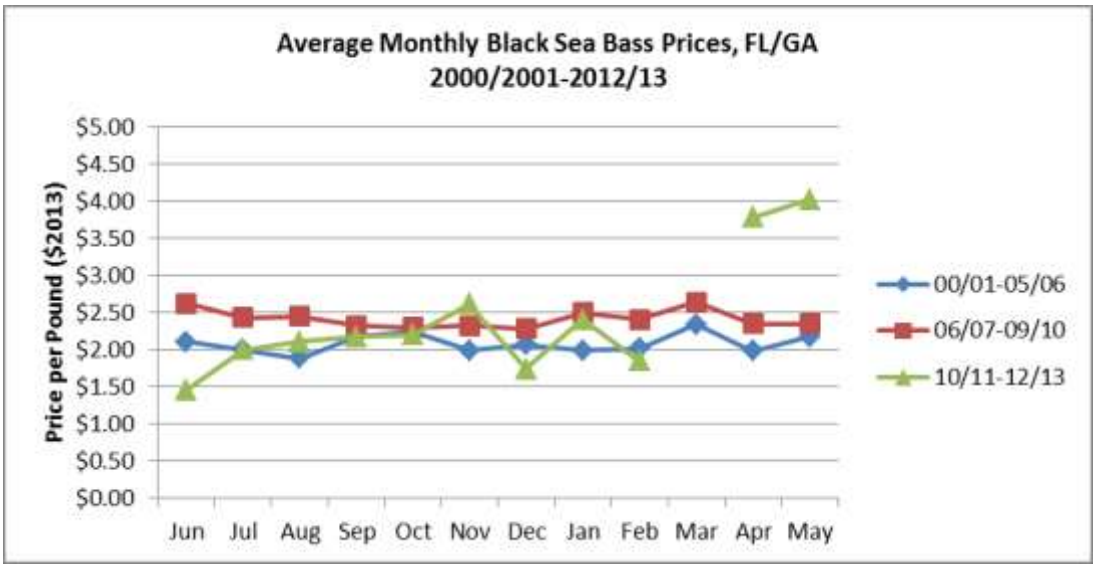

Figure 3.3.1.10. Average monthly FL/GA black sea bass prices (2013 $), fishing years 2000/01-2012/13.
Source: SEFSC Commercial ACL Dataset, ACL_Tables_07102014

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.

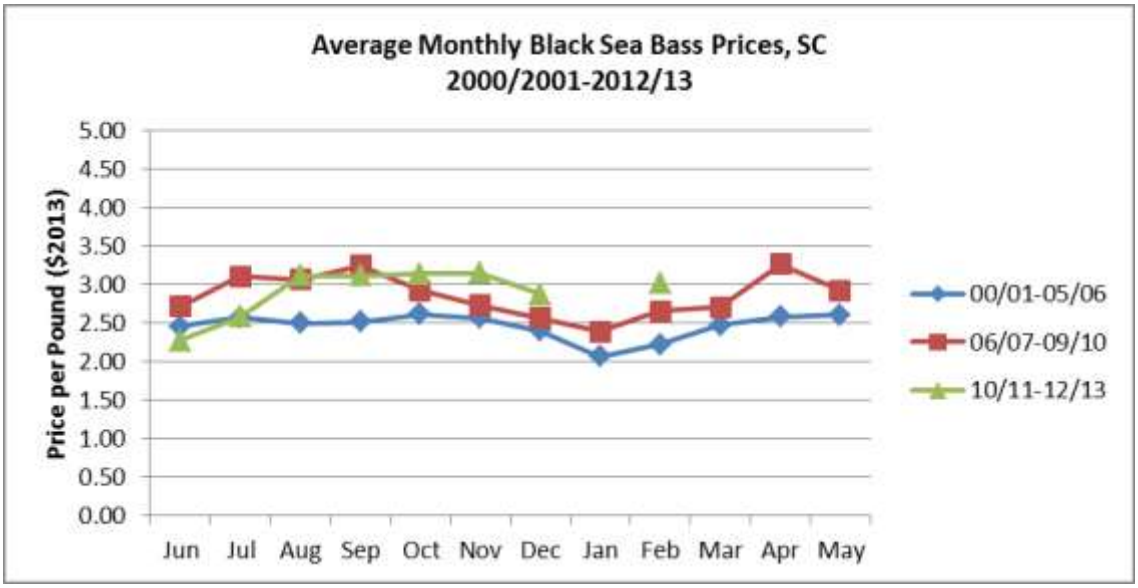

Figure 3.3.1.11. Average monthly SC black sea bass prices (2013 $), fishing year 2000/01-2012/13.
Source: SEFSC Commercial ACL Dataset, ACL_Tables_07102014

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.

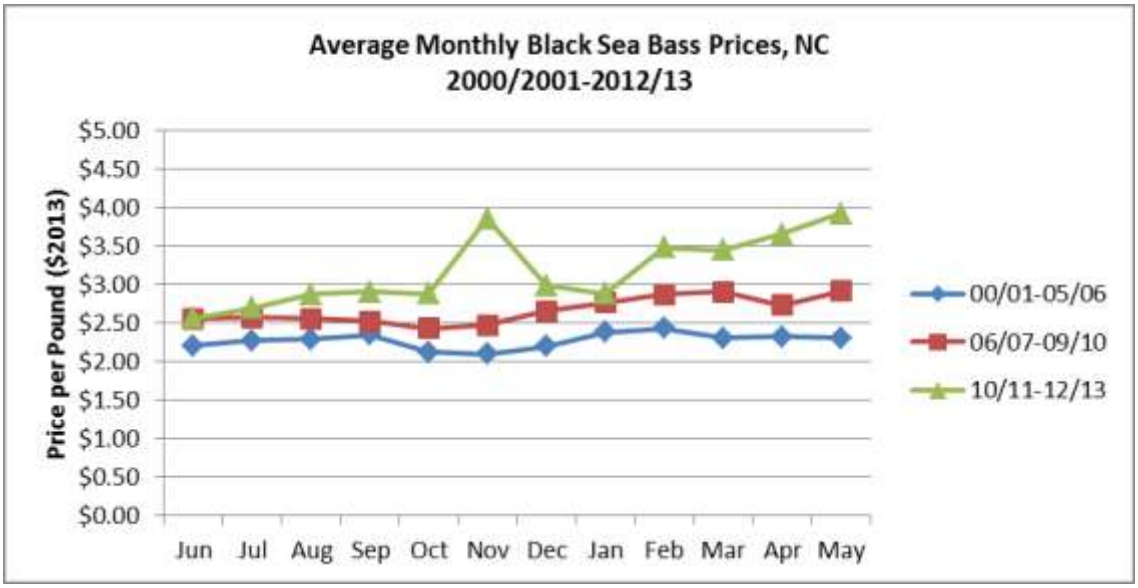

Figure 3.3.1.12. Average monthly NC black sea bass prices (2013 $), fishing year 2000/01-2012/13.
Source: SEFSC Commercial ACL Dataset, ACL_Tables_07102014

Trip 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 for all gear types.

Year	Number vessels that landed black sea bass	Number trips that landed black sea bass	Black sea bass landings (lb gw)	Black sea bass quota or ACL	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	None	$1,278,557	1,501,126	$4,485,103	$5,763,660
2001/02	250	3,019	495,863	None	$1,165,505	1,928,448	$5,546,695	$6,712,199
2002/03	235	2,244	361,497	None	$853,225	1,484,873	$4,193,030	$5,046,256
2003/04	239	2,365	656,446	None	$1,511,486	1,428,869	$4,102,985	$5,614,471
2004/05	240	2,319	533,149	None	$1,270,898	1,637,229	$4,600,940	$5,871,838
2005/06	224	2,058	346,034	None	$974,884	1,434,845	$4,250,338	$5,225,222
2006/07	242	2,107	452,314	423,000 gw	$1,327,408	1,357,072	$4,155,409	$5,482,817
2007/08	254	1,921	318,249	309,000 gw	$914,222	1,339,664	$4,115,800	$5,030,021
2008/09	270	1,968	388,629	309,000 gw	$1,066,824	1,458,016	$4,287,517	$5,354,341
2009/10	248	1,637	326,906	309,000 gw	$848,990	1,147,186	$3,287,444	$4,136,434
2010/11	210	1,336	391,631	309,000 gw	$1,022,432	903,470	$2,590,011	$3,612,444
2011/12	178	666	300,665	309,000 gw	$644,100	324,237	$970,480	$1,614,580
2012/13	198	1,262	304,776	309,000 gw	$886,002	747,860	$2,297,386	$3,183,388
2013/14	234	2,697	528,187	780,020 ww	$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 for all gear types.

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 pots 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 pots are highly dependent on black sea bass. Fishing year 2000/01 had the most number of vessels landing black sea bass using pots, but the highest black sea bass landings using pots 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 pots, 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 pots for harvesting black sea bass constrained the landings of vessels that used pots.

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 by pots.

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 pots 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 pots 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 by pots.

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 gear, but the highest black sea bass landings and revenues from black sea bass using other gear 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 pots 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. Some of the increase in vessels harvesting black sea bass by non-pot gear could be some of the vessels that previously had used pot gear, but did not qualify for an endorsement.

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 by other gear types.

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 gear 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 gear 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 by other gear types.

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

Trip Level Landings and Dockside Revenues for Black Sea Bass: Endorsement Holders Using Pots

The following describes the performance of vessels used by endorsement holders for the period 2000/01 through 2013/14. The pot 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 (**Appendix N**). This dataset was merged with the logbook-based dataset provided by SEFSC (L. Perruso, pers. comm., 2015) to generate the corresponding revenue information. Due to incomplete linking of all vessels that endorsement holders used for the 2012/13 and 2013/14 fishing seasons, only trips by vessels with an endorsement that used pots are included for these fishing years.

From 2000/01 through 2013/14, an annual average of 31 vessels with an endorsement took 539 commercial trips using pots that combined landed an average of 276,160 lb gw of black sea bass annually with a dockside value (2013 dollars) of $721,021 (**Table 3.3.1.11**). These vessels also caught other species jointly with black sea bass at an annual average of 90,357 lb gw with a dockside value of $224,821. Fishing years 2001/02 and 2008/09 had the most number of vessels landing black sea bass, but the most number of trips occurred in 2001/02. 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 (except for 2013/14) from black sea bass were below the average for the entire period.

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

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	33	607	238,879	$589,903	92,467	$233,778	$823,680
2001/02	35	786	261,521	$614,122	159,220	$397,211	$1,011,333
2002/03	33	617	209,662	$493,839	109,716	$277,488	$771,327
2003/04	30	713	402,176	$925,927	92,721	$247,004	$1,172,931
2004/05	32	644	384,120	$919,044	109,363	$273,552	$1,192,596
2005/06	31	643	263,156	$748,200	123,611	$311,317	$1,059,517
2006/07	32	714	368,824	$1,084,298	122,511	$305,648	$1,389,946
2007/08	31	545	237,158	$690,107	132,968	$347,443	$1,037,550
2008/09	36	525	280,935	$782,136	94,689	$233,245	$1,015,381
2009/10	28	448	255,549	$652,247	89,754	$207,271	$859,518
2010/11	29	388	308,512	$804,169	54,157	$129,409	$933,578
2011/12	32	179	183,861	$421,165	40,902	$101,019	$522,184
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	31	539	276,160	$721,021	90,357	$224,821	$945,842

Note: For 2012/13 and 2013/14, trips taken by vessels that used pots within the fishing year are assumed to be made by vessels with a pot endorsement.
Source: SEFSC Coastal Fisheries Logbook for weight, NMFS ALS for revenues, and SERO-Permits for endorsement holders, L. Perruso, pers. comm., 2015; SERO-LAPP-2014-09.

Combining all sources of revenues, the average annual dockside revenues of vessels with an endorsement that landed black sea bass was $38,097 (2013 $) (**Table 3.3.1.12**). As noted, the 2012/13 and 2013/14 data assumes trips taken by vessels using pots anytime during the fishing year were made by vessels with an endorsement.

Table 3.3.1.12. Dockside revenues (2013 $) from all sources for vessels that landed black sea bass, fishing years 2000/01–2013/14 by endorsement holders.

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	33	$589,903	$233,778	$238,618	$1,062,298	$32,191
2001/02	35	$614,122	$397,211	$226,014	$1,237,347	$35,353
2002/03	33	$493,839	$277,488	$282,867	$1,054,194	$31,945
2003/04	30	$925,927	$247,004	$146,798	$1,319,729	$43,991
2004/05	32	$919,044	$273,552	$245,078	$1,437,674	$44,927
2005/06	31	$748,200	$311,317	$189,003	$1,248,520	$40,275
2006/07	32	$1,084,298	$305,648	$212,851	$1,602,797	$50,087
2007/08	31	$690,107	$347,443	$366,890	$1,404,440	$45,305
2008/09	36	$782,136	$233,245	$399,694	$1,415,076	$39,308
2009/10	28	$652,247	$207,271	$280,625	$1,140,143	$40,719
2010/11	29	$804,169	$129,409	$276,179	$1,209,756	$41,716
2011/12	32	$421,165	$101,019	$556,560	$1,078,744	$33,711
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	31	$721,021	$224,821	$244,693	$1,190,535	$38,097

Note: For 2012/13 and 2013/14, trips taken by vessels that used pots within the fishing year are assumed to be made by vessels with a pot endorsement.
Source: SEFSC Coastal Fisheries Logbook for weight, NMFS ALS for revenues, and SERO-Permits for endorsement holders, L. Perruso, pers. comm., 2015; SERO-LAPP-2014-09.

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 **Appendix N**, for landings and the NOAA fisheries website for accessing recreational data file://localhost/(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.

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

Source: SEFSC MRIPACLspec_rec81_13wv6_21Feb14; SERO-LAPP-2014-09.
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	Total
2009/10	232,928	32,169	285,718	189,940	740,755
2010/11	221,968	41,436	156,218	151,410	571,032
2011/12	246,449	48,748	179,657	163,458	638,312
2012/13	106,209	13,548	138,706	125,143	383,606
Average	201,888	33,975	190,075	157,488	583,426

Source: SEFSC MRIPACLspec_rec81_13wv6_21Feb14; SERO-LAPP-2014-09
Note: Landings for 2013 are incomplete and headboat landings for 2013 are not yet available.

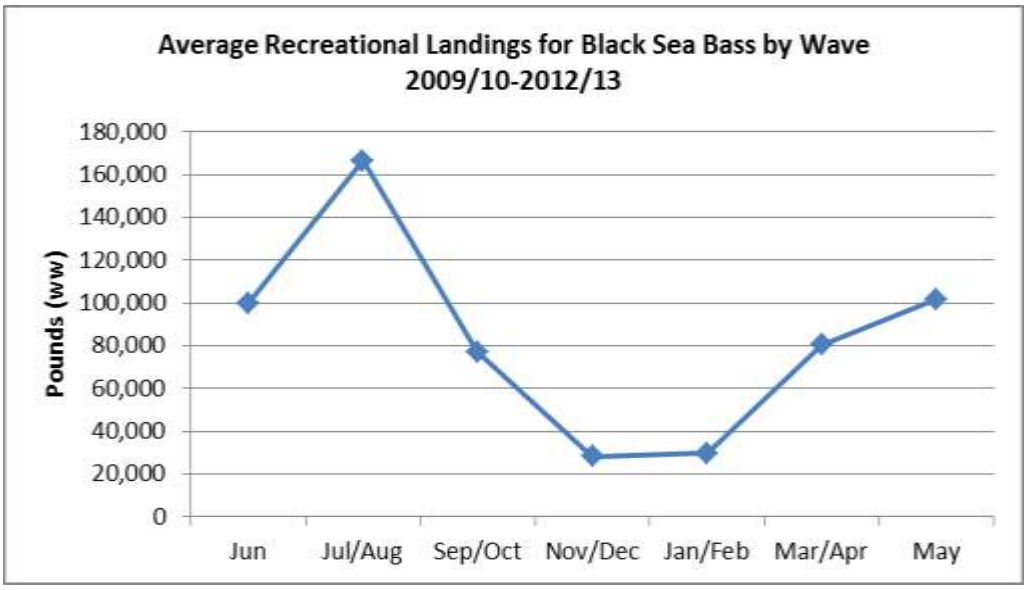

Figure 3.3.2.1. South Atlantic average recreational landings for black sea bass by wave, fishing year 2009/10-2012/13.
Source: SEFSC MRIPACLspec_rec81_13wv6_21Feb14; SERO-LAPP-2014-09
Note: Landings for 2013 are incomplete and headboat landings for 2013 are not yet available.

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 in the South Atlantic 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

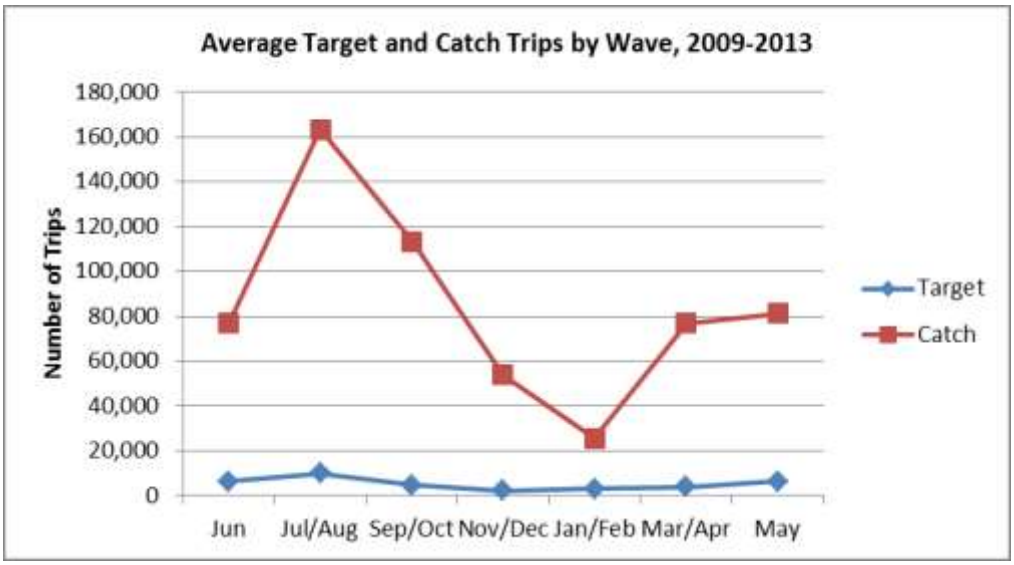

Figure 3.3.2.2. South Atlantic average target and catch trips by wave, fishing year 2009/10-2012/13.

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 (**Table 3.3.2.5**).

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, $11.90 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 al et. (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. Before the winter prohibition on pot fishing, the majority of commercial harvest was landed using pot gear off the coasts of North and South Carolina. In the recent Amendment 18A (SAFMC 2012), 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.

In addition, Amendment 18A (SAFMC 2012) added an endorsement to limit participation in the pot sector, reducing the number of active fishermen from approximately 55-60 to 32 valid or renewable endorsements. As of August 20, 2015, 14 endorsements are associated with communities in North Carolina, 8 endorsements with communities in South Carolina, two endorsements in Georgia, and 8 endorsements with Florida communities. It should be noted that in recent months, several endorsements have been transferred to different businesses, including two endorsements now associated with Georgia. 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 and Charleston. The Florida communities of note include several communities north of Cape Canaveral, including Port Orange, Ormond Beach, and Ponce Inlet. Until the summer months of 2015, few endorsements had been transferred from the original issue to a different snapper grouper permit holder. However, recently several endorsements have been transferred to other snapper grouper permit holders, indicating that the fishery is transitioning to adapt to recent changes to the fishery.

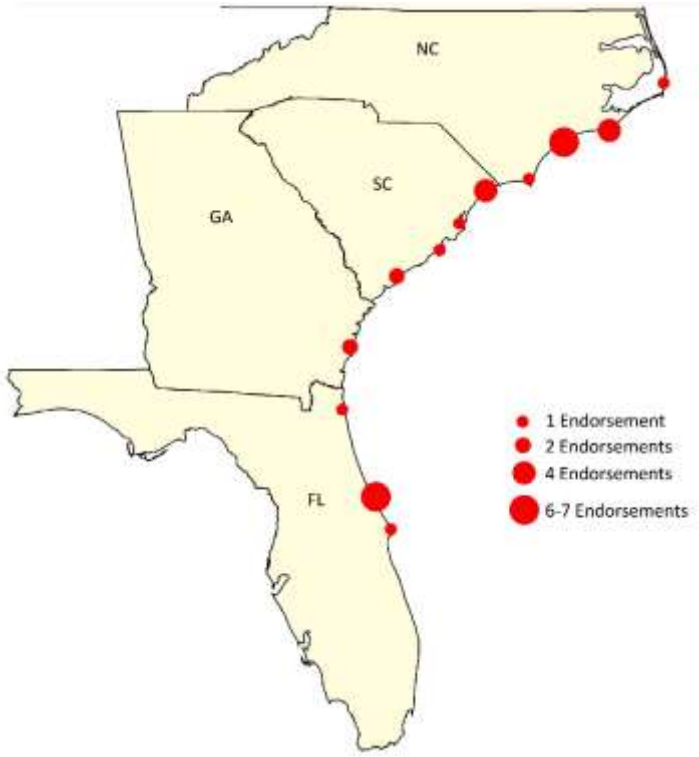

Figure 3.3.3.1. Distribution of black sea bass pot endorsements as of August 24, 2015
Source: SERO Permits 2015

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 regulatory amendment will primarily affect commercial black sea bass pot fishermen, with some indirect effects for commercial black sea bass fishermen using other types of gear.

Figure3.3.3.2 shows the top fishing communities in the South Atlantic 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.

Most black sea bass pot endorsement holders participate in several other fisheries throughout the year (**Appendix I**) and hold other commercial permits. The pot endorsement is one of several permits in the fishermen's portfolios. Public comments received specifically about the value of access to the pot fishery in the winter months are discussed in more detail in **Appendix L**.

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.

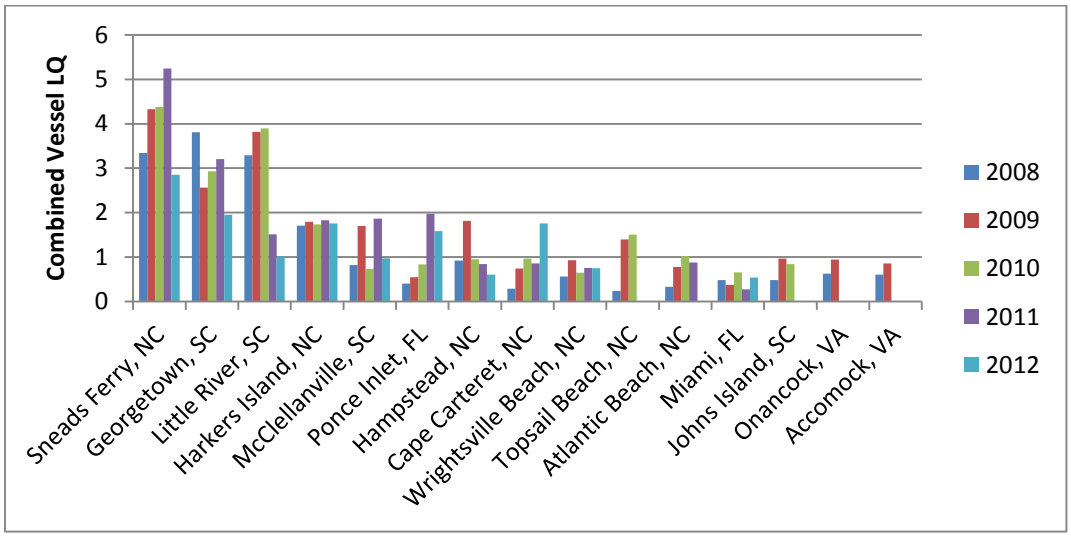

Figure 3.3.3.2. Combined vessel local quotients (LQs) for black sea bass harvested with pots in the top communities for 2008-2012.
Source: SEFSC ALS

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 harvested 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.

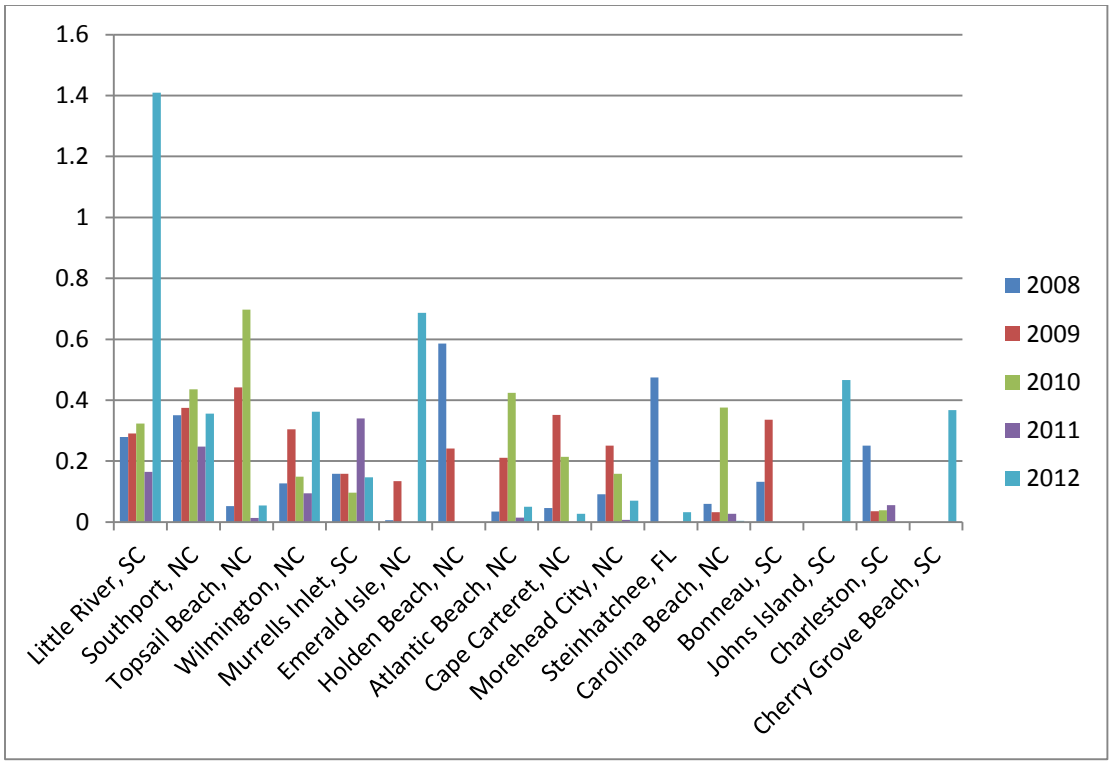

Figure 3.3.3.3. Combined vessel local quotients (LQs) for black sea bass harvested with bandit gear in the top communities for 2008-2012.
Source: SEFSC ALS

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 2012; 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.

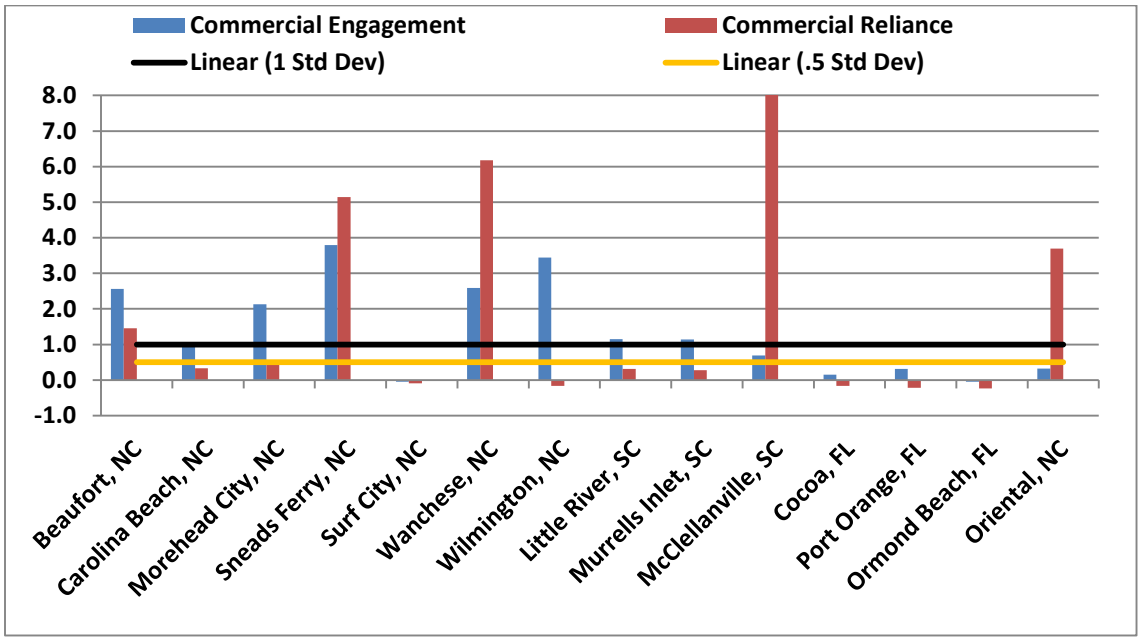

Figure 3.3.3.4. Commercial fishing engagement and reliance for top black sea bass fishing communities. Source: SERO Social Indicator Database 2013

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, North Carolina 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 regulatory 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 **Chapter 4**, **Section 4.1.3**.

3.3.4 Environmental Justice

In order to assess whether a community may be experiencing environmental justice (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.

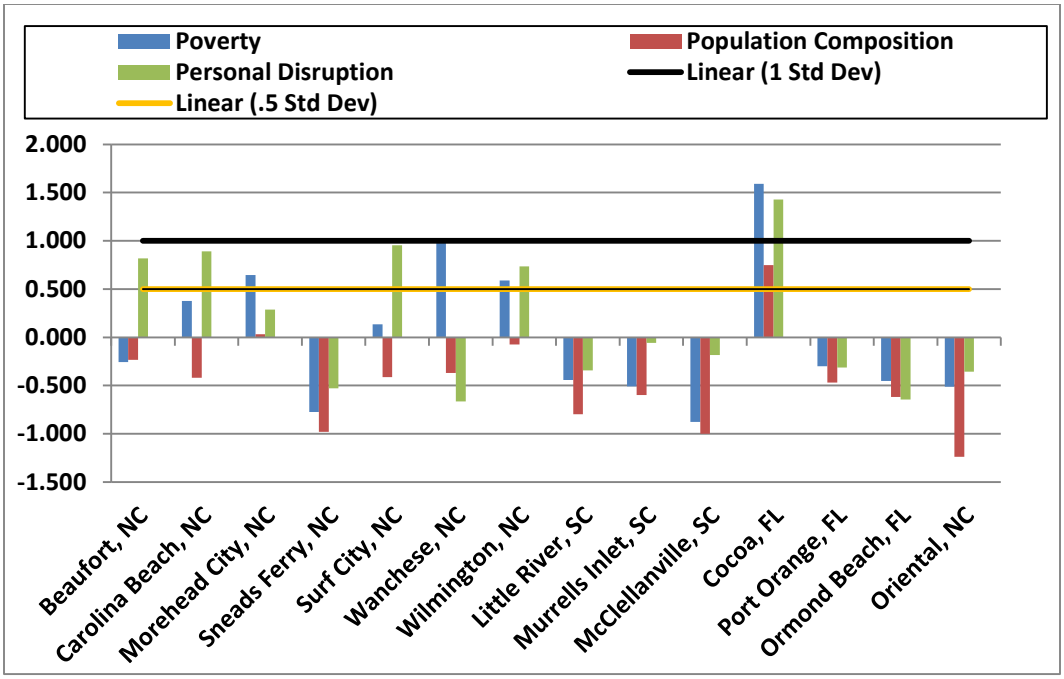

Figure 3.3.4.1. Social Vulnerability indices for black sea bass fishing communities in terms of pounds and value regional quotient in the South Atlantic.
Source: SERO Social Indicator Database 2014

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 3.3.4.1** 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) provides sufficient opportunity for meaningful involvement by potentially affected individuals to participate in the development process of this regulatory 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 regulatory amendment.

3.4 Administrative Environment

3.4.1 The Fishery Management Process and Applicable Laws

3.4.1.1 Federal Fishery Management

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

Responsibility for federal fishery management decision-making is divided between the U.S. Secretary of Commerce (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 the National Marine Fishery Service (NMFS).

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

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

and fishery management plans/amendments. In addition, the regulatory process is in accordance with the Administrative Procedure Act, in the form of "notice and comment" rulemaking.

3.4.1.2 State Fishery Management

The state governments of North Carolina, South Carolina, Georgia, and Florida have the authority to manage fisheries that occur in waters extending three nautical miles from their respective shorelines. North Carolina's marine fisheries are managed by the Marine Fisheries Division of the North Carolina Department of Environmental Quality. 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.

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

4.1.1 Biological/ Ecological Effects

Black Sea Bass

The alternatives range from maintaining the current prohibition on use of black sea bass pots in the entire exclusive economic zone (EEZ) from November 1 through April 30, annually (**Alternative 1 (No Action))** to allowing the black sea bass pot sector to operate based on varying spatial and seasonal closures. **Alternative 2** would prohibit black sea bass pots within the currently designated North Atlantic Right Whale NARW) 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. **Alternatives 7a-7c** combine the area designated for NARW critical habitat with additional area off the Carolinas and northern Georgia that would close the areas for differing times. **Alternatives 8a** and **8b** combine the area closure for Florida and Georgia in **Alternative 5** with the area closure for North Carolina and South Carolina from **Alternative 7** over differing time frames. **Alternative 9a** combines **Alternative 5** for the closure off Florida and Georgia with a

***Action 1 Alternatives*[1]**
*(preferred alternative 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 Daytona Beach to Savannah and 30 m or shallower from Savannah to C. Hatteras.
5. Closure from Nov 1 – April 30 between Daytona Beach & 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. Off FL/GA same as Alt 5. Off SC/NC < 25 m.
   - 8a. Closure Nov 1 – Apr 15.
   - 8b. FL/GA closure Nov 15 – Apr 1 SC/NC closure Nov 1 – Dec 15 and Feb 15 – Apr 30.
9. Off FL/GA same as Alt 5. Off SC/NC < 20 m.
   - 9a. Closure Nov 1 – Apr 15.
   - 9b. FL/GA closure Nov 15 – Apr 15. SC/NC closure Nov 1 – Dec 15 and Feb 15 – Apr 30.
10. Off FL/GA same as Alt 5 with closure Nov 15 – Apr 15. Off SC/NC Nov 1 – Dec 15 < 20 m. Off SC/NC Feb 15 1 – Apr 30 < 25 m.
11. **Nov 1 – 30 and Apr 1 - 30 off FL/GA same as Alt 5, off SC/NC same as Alt 8. Dec 1 – Mar 31, off FL/GA closure < 25 m, off SC/NC closure < 30 m.**
12. Nov 1 – Apr 30, midpoints between proposed closure Alts 4 and 8.

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

closure off North Carolina and South Carolina based on the 20 meter depth contour from November 1 through April 15. **Alternative 9b** has the same area closure as **Alternative 9a** but would close from November 15 through April 15 off Florida and Georgia and would close off North Carolina and South Carolina from November 1 through December 15 and February 15 through April 30. **Alternative 10** has the same area closure off Florida and Georgia as **Alternative 5** with a seasonal closure from November 15 through April 15 and would close off North Carolina and South Carolina from November 1 through December 15 in waters less than 20 meters (66 feet) and from February 15 through April 30 in waters less than 25 meters (82 feet). **Preferred Alternative 11** has the same area closure as **Alternative 5** off Florida and Georgia and **Alternative 8** off North and South Carolina from November 1 through November 30 and April 1 through April 30 and **Alternative 4** for all areas from December 1 through March 31. **Alternative 12** is the mid-point between **Alternative 4** and **Sub-Alternative 8a** and would apply from November 1 through April 30.

The expected closure date ranges for the commercial black sea bass season 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-2015-09; included as **Appendix N**). 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 Council chooses, no biological impacts to the black sea bass stock are expected. Adverse biological effects are prevented because overall harvest in the commercial sector is limited to the commercial ACL; commercial accountability measures (AMs) are also in place. The ACL, which is a function of the acceptable biological catch (ABC) 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 allow harvest of 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 with a January 1 fishing year start date.

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Alternative 1	No Closure	No Closure	No Closure	No Closure
Alternative 2	10/2	8/4	10/26 - 11/4	11/19 - 12/3
Alternative 3	11/26 - 12/5	10/4 - 10/17	10/26 - 11/4	11/19 - 12/3
Alternative 4	12/20 - 12/30	12/7 - 12/22	12/11 - 12/18	12/19 - 12/30
Alternative 5	12/16 - 12/24	12/1 - 12/11	12/6 - 12/11	12/15 - 12/23
Alternative 6	12/20 - NC*	12/7 - 12/25	12/10 - 12/20	12/19 - NC
Sub-Alternative 7a	10/11 - 10/12	8/18 - 8/20	10/6 - 10/9	10/7 - 10/9
Sub-Alternative 7b	12/28 - NC	12/18 - 12/30	12/17 - 12/21	12/28 - NC
Sub-Alternative 7c	12/22 - 12/28	12/9 - 12/17	12/11 - 12/14	12/23 - 12/29
Sub-Alternative 8a	12/6 - 12/11	10/14 - 10/25	10/29 - 11/5	12/5 - 12/9
Sub-Alternative 8b	12/29 - NC	12/20 - 12/30	12/18 - 12/21	12/29 - NC
Sub-Alternative 9a	10/28 - 11/9	9/15 - 9/27	10/13 - 10/19	10/24 - 11/3
Sub-Alternative 9b	12/26 - NC	12/15 - 12/28	12/14 - 12/20	12/26 - NC
Alternative 10	12/27 - NC	12/17 - 12/29	12/16 - 12/20	12/28 - NC
Preferred Alternative 11	**12/18 - 12/28**	**12/3 - 12/18**	**12/6 - 12/13**	**12/17 - 12/27**
Alternative 12	12/15 - 12/23	11/21 - 12/10	12/5 - 12/11	12/14 - 12/22

* NC = No Closure
Source: **Appendix N**; **Appendix I**

Bycatch

Catch in the black sea bass pot sector consists of two components: landed fish and discarded bycatch. The landed catch was analyzed using logbook data reported by fishermen for trips with landings of black sea bass reported. The total number of trips catching black sea bass, total catch of each species or category, and catch per trip was summarized. The catch per trip was simply the total landings for each market category divided by the total number of trips. Data on landed catch might have changed over time due to seasonal restrictions, desirability of the species, gear restrictions, and improved reporting. It cannot be determined if a change in landings or average catch per trip is due to regulation effects or population effects. The landings are associated with the pot sector; however, the species could have been harvested using other gear.

Besides black sea bass, landed catch, which averaged greater than 2 pounds (lbs) per trip associated with the black sea bass pot sector from 2000 to 2011, consisted of white grunt, king mackerel, cero mackerel, triggerfishes, king mackerel, blueline tilefish), and unclassified scups or porgies (**Figure 4.1.1.1**). The average landings of catch per trip of species other than black sea bass was 78 lbs from 2000 to 2011, while the average catch of black sea bass per trip was 629 lbs. The time period selected was based on the timing of the pot endorsement becoming effective in 2012.

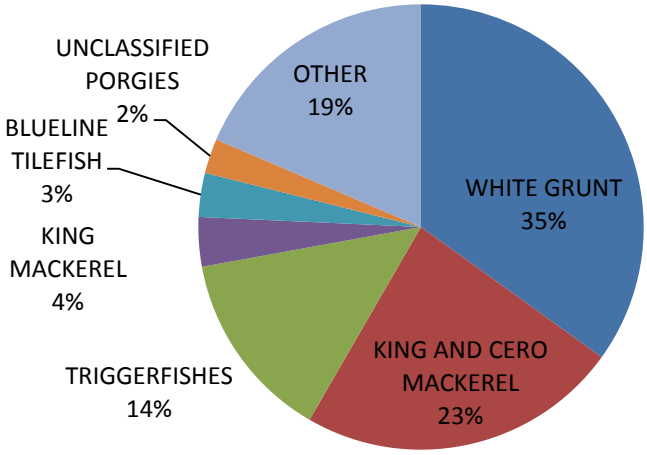

Figure 4.1.1.1. Percentage of landed catch in the black sea bass pot sector for landings categories from 2000 to 2011.
Source: SEFSC Commercial Logbook (accessed May 2015) and Commercial Discard Logbook (accessed November 2014).

In 2012 and 2013, the landed catch from black sea bass pots (other than black sea bass), which averaged greater than 2 lbs per trip associated consisted of white grunt, triggerfishes, greater amberjack, red porgy, wahoo, king mackerel, bluefish, gag, and red snapper (**Figure 4.1.1.2**). The average landings of catch per trip for species besides black sea bass was 63 lbs from 2012 and 2013. The average landings of black sea bass was 645 pounds. In both time periods, white grunt, triggerfish, and king mackerel were commonly landed species associated with the black sea bass pot sector. The remaining species varied over the time period. The change in the landed species could have resulted from different seasons of fishing, restrictions on the pot sector, change in the distribution of the pot sector, change in abundance, or change in desirability of different species. The effect of the different alternatives on the landed incidental catch in black sea bass pots cannot be determined. The hook and line sector has a much higher diversity in landing categories than pot gear. Thus, if black sea bass pot fishermen shift to hook and line gear, it would be difficult to determine the targeted species.

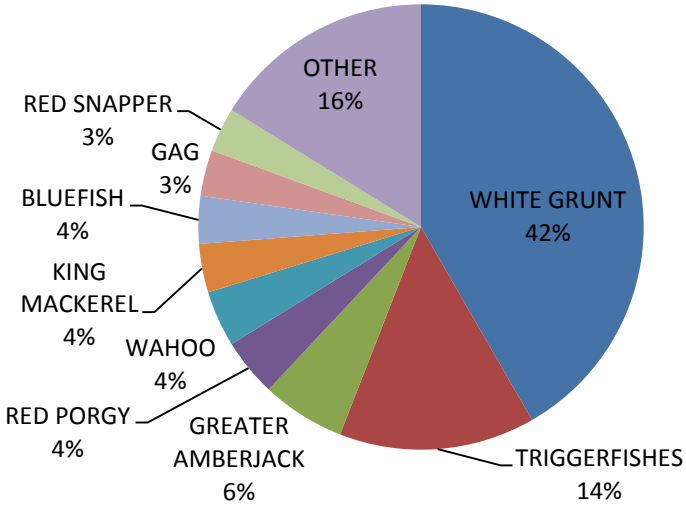

Figure 4.1.1.2. Percentage of landed bycatch in the black sea bass pot sector for landings categories from 2012 and 2013.
Source: SEFSC Commercial Logbook (accessed May 2015) and Commercial Discard Logbook (accessed November 2014).

The discarded bycatch greater than 10 fish per trip included black sea bass, spottail pinfish, gray triggerfish, white grunt, and scup (**Table 4.1.1.2**). The greatest number of fish discarded was black sea bass and averaged 3,709 fish per year. Fishermen did not report discarding greater than 100 fish per year for any other species.

Table 4.1.1.2. Top ten stocks with mean estimated South Atlantic commercial discards (#fish) during snapper grouper trips (defined as trips with >50% of landings from snapper grouper stocks), sorted from largest to smallest, by gear, for the 2009-2013 period.

Stock	Handline /Electric	Stock	Pot
yellowtail snapper	5483.2	black sea bass	3708.8
gray snapper	1887.4	pinfish spottail	59
black sea bass	1274.6	gray triggerfish	54.8
red snapper	1132.6	white grunt	43.6
vermilion snapper	721.6	grunts	32.7
red porgy	640.7	scup	30.8
gag	492.3	red porgy	27.6
unc amberjack	172.2	finfishes unc	8.3
unc groupers	143.9	gag	8.2
unc snappers	130.9	vermilion snapper	5.8

Source: SEFSC Commercial Logbook (accessed May 2015) and Commercial Discard Logbook (accessed November 2014).

Protected Resources

The South Atlantic black sea bass pot sector is listed as part of the larger "Atlantic mixed species trap/pot fishery" under the List of Fisheries (LOF). The National Marine Fisheries Service (NMFS) publishes annually the LOF as required by the Marine Mammal Protection Act (MMPA). The LOF classifies U.S. commercial fisheries into one of three categories according to the level of incidental mortality or serious injury of marine mammals:

I. **frequent** incidental mortality or serious injury of marine mammals
II. **occasional** incidental mortality or serious injury of marine mammals
III. **remote likelihood of/no known** incidental mortality or serious injury of marine mammals.

The classification of a fishery on the LOF determines whether participants in that fishery are subject to certain provisions of the MMPA, such as registration, observer coverage, and take reduction plan (TRP) requirements.

The Atlantic mixed species trap/pot fishery (of which the Council's black sea bass pot sector is a part) is considered a Category II fishery under the LOF because it occasionally causes incidental mortality or serious injury to marine mammals. The Atlantic mixed species trap/pot fishery has interacted with fin and humpback whales (January 28, 2015, 79 FR 77919). Some pot gear in other areas are Category I fisheries under the LOF because they are known to frequently cause incidental mortalities or serious injuries of marine mammals. Category I fisheries have been documented to cause serious injury and death to NARW (Johnson et al. 2005, Knowlton et al. 2012). Other trap/pot fisheries are classified as Category III fisheries because there is a remote likelihood of or no known incidental mortality or serious injury of marine mammals.

Entanglements incidental to commercial fishing are the primary threat to right whales; however, less is known about the source of entanglement. In a study of 31 right whale entanglements, Johnson et al. (2005) found 14 cases where gear type could be identified; pot gear represented 71% of these cases (8 lobster pots, 1 crab pot, 1 unknown pot). In a recent compilation of data from 2007-2014, there were 17 entangled whales and none of these were attributed to a specific fishery (Waring et al. 2014). These data indicate information from an entanglement event often does not include the detail necessary to assign the entanglements to a particular fishery or location, and scarring studies suggest the vast majority of entanglements are not observed (Waring et al. 2014). Consequently, while black sea bass pot gear has not been definitively identified in a right whale entanglement, right whale entanglements in gear consistent with that used in the commercial black sea bass sector have been documented. Knowlton et al. (2015) examined line characteristics of fishing gear removed from live and dead entangled whales from the U.S. East Coast and Canada from 1994-2010. Of 132 ropes from 70 cases, they found 26% of ropes were in the range of 0.312 in (~5/16 in) to .654 in (11/16 in) diameter and made out of polypropylene (Knowlton et al, in press). Levesque (2009) interviewed 42 black sea bass pot fishermen from major fishing ports in the area from Georgia through North Carolina. Fishermen reporting using 1/4 in, 5/16 in, or 3/8 in diameter buoy lines and most used line made out of polypropolene (Levesque 2009).

The western NARW stock is endangered and the minimum population size was 455 individuals in 2012 (Waring et al. 2014). The potential biological removal (PBR) for right

whales is 0.9 individuals, and any mortality or serious injury is considered significant (Waring et al. 2014). (PBR 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 optimum sustainable population.) 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). Specifically, the current rate of fishery entanglements averages 3.25 animals per year and is 3.6 times over PBR (Waring et al. 2014). Additionally, an increase in mortality in 2004 and 2005 was cause for serious concern (Kraus et al. 2005; Waring et al. 2014). Calculations based on demographic data through 1999 (Fujiwara and Caswell 2001) indicated that this mortality rate increase would reduce population growth by approximately 10% per year (Kraus et al. 2005; Waring et al. 2014). Of those mortalities, six were adult females, three of which were carrying near-term fetuses. Furthermore, four of these females were just starting to bear calves, losing their complete lifetime reproduction potential. From 1998-2000, strong evidence suggested a flat or negative growth in the minimum number of animals alive, which coincided with very low calf production in 2004 (Waring et al. 2014). However, the population has continued to grow since that apparent interval of decline. Examination of the minimum population estimates for NARW indicates an estimated population growth rate of 2.8% per year from the 1990s to 2010s (Waring et al. 2014).

Potential serious injury or mortality to right whales should be considered for management measures in the black sea bass pot sector because right whales may be found in the Council‘s jurisdiction from November 1 through April 30 (NMFS 2008). The bulk of the black sea bass pot effort traditionally operated from November to April. Since 2010, the black sea bass pot sector has not fished during this time due to ACL closures (2010, 2011, and 2012) or by regulation (2013 to present). A regulatory closure of the pot sector from November 1 through April 30 was implemented in 2013, via Regulatory Amendment 19 to the Snapper Grouper FMP (2013b). The regulatory closure was implemented to protect endangered right whales while allowing an increase in the ACL. Had the regulatory closure not been implemented, the potential for black sea bass pot gear interactions with right whales would have increased, requiring re-initiation of formal consultation under the Endangered Species Act (ESA) which would have delayed the ACL increase.

Throughout the range of the NARW, the NMFS budgeted $8.7 million in fiscal year (FY) 2013 and $8.4 million in FY 2014 in whale recovery budgets. As an example, NMFS (NMFS SERO PRD 2015) estimates that it cost $87,900 for a multi-agency attempt to rescue a right whale in trap/pot gear in 2010/2011. Between FY 2003 and FY 2005, the costs of actions to reduce fishery bycatch of NARW were between $4.9 million and $7.7 million across several federal and non-governmental organizations (Reeves et al. 2007). During the FY 2003-2005, the multi-agency costs to promote NARW recovery ranged from $13.1 million to $16.7 million throughout the NARW range (Reeves et al. 2007).

Restrictions to black sea bass pot sector were implemented via Amendment 18A to the Snapper Grouper FMP (Amendment 18A; SAFMC 2012) in 2012. The Council developed Amendment 18A to modify the rebuilding strategy including the ABC, ACL, and AMs, reduce participation and effort in the black sea bass pot segment of the snapper grouper fishery, and adjust the system of accountability in the recreational sector. Specifically, the Council

established a maximum of 35 pots per fishermen, required that pots be removed from the water when a trip is completed, established an endorsement to limit the number of fishermen (32 fishermen) that could use pots to harvest black sea bass, and increased the recreational size limit. Since these restrictions were enacted, the average number of pots in the water per day is 75 for all endorsement holders combined, with a maximum reported number of pots fished on a day of 278; the total pots fished in one day cannot exceeded 1,120 pots (32 fishermen times 35 pots) in the South Atlantic (SAFMC 2012). While not the purpose of the Amendment 18A, many requirements it implemented likely have some ancillary biological benefits to NARW. However, the most notable large whale entanglement risk reduction measure in the Council's commercial black sea bass pot sector is that the black sea bass fishing season has not co-occurred with the right whale season for the last several years (July 16, 2013; 78 FR 42654).

To quantify the different alternatives in **Action 1**, an entanglement relative risk analysis was conducted to estimate the biological effects of proposed closures on black sea bass pot gear fishing and NARW entanglement risk (**Appendix N**). Data on actual interactions between black sea bass pots and NARW do not exist, so the co-occurrence of gear and whales was used as a proxy for entanglement risk. This co-occurrence model estimated the relative risk of entanglement relative to each alternative. The distribution of whales in the model was simulated using approaches described in **Appendix N**. This analysis was reviewed by the Southeast Fishery Science Center, the Atlantic Scientific Review Group (SRG), and the Council's Scientific and Statistical Committee (SSC). The SRG advises NMFS and U.S. Fish and Wildlife Service on the status of marine mammal stocks (under Section 117 of the Marine Mammal Protection Act). Comments from the SSC's October 2014 review of the analysis were addressed, and an updated analysis was presented to the SSC in April 2015. These scientific review bodies agreed that the whale interaction prediction model provided a reasonable proxy for the relative entanglement risk associated with each of the proposed alternatives. The analysis of uncertainty in the model indicated that the differences between alternatives were robust. The Atlantic SRG found that modeled distribution of right whales off North Carolina was valid and consistent with the expectations of experts on right whale biology. In April 2015, the SSC agreed that the updated analysis addressed all the concerns they had raised in their October 2014 meeting, and the analysis represented the best available scientific information on right whale entanglement relative risk associated with the proposed alternatives in Regulatory Amendment 16.

Due to uncertainty in how the black sea bass pot sector would proceed with their first winter opening since December 2010, many different scenarios were considered in the entanglement relative risk analyses (**Appendix N**). The scenarios considered various combinations of the spatial distribution of landings and effort, and factors that affected catch rate projections. These scenarios produced a range of potential closure dates (**Table 4.1.1.1)**.

Regardless of which alternative the Council chooses, no biological impacts to the black sea bass stock are expected. No adverse biological effects are anticipated because overall harvest in the commercial sector is limited to the commercial ACL by the commercial AM, and the ACL, which is a function of the ABC, 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 offer no advantages to the black sea bass stock in terms of further reduced

harvest because it is estimated that 97-100% of the ACL would be taken (**Appendix N**). Therefore, there is no difference in the biological effects on black sea bass from the alternatives.

The alternatives under consideration differ substantially in their potential biological effects on ESA-listed large whales. The comparison of alternatives below is based primarily on the analysis in SERO-LAPP-2014-09 (**Appendix N; Table 4.1.1.3**). The analysis simulated the potential landings of black sea bass pot endorsement holders during a winter season for **Alternatives 1** through **12**. Factoring in landings by other gear, the date the ACL would be met under each scenario was predicted. The analysis also considers overlays of the co-occurrence of the seasonal distribution of black sea bass pot gear and North Atlantic right whales as a proxy for the relative risk of right whale entanglements under each of the proposed alternatives. Overlaying distributions of right whales with fisheries/ships/etc., is an established way of evaluating risk from activities of interest (NMFS 2015b, Redfern et al. 2013). Due to differences in right whale sampling protocols and data availability, separate models that overlayed right whale and black sea bass fishing effort were generated for two regions: for North Carolina and for South Carolina to Florida. The resulting analysis estimated the relative risk of entanglement for a given alternative in those two regions.

Table 4.1.1.3. Ranked projected risk of right whale entanglement in pot gear vertical lines (in relative risk units; RRU) under proposed Alternatives in Regulatory Amendment 16. **Alternative 1** is the no action alternative.

RISK	Relative Risk of Alternative (Min-Max in Parentheses)
Low	Alt1: no risk of entanglement (0 RRU)
	Alt6: low increase in risk off NC (+2-8 RRU); no additional risk off FL-SC (0-0 RRU).
	Alt4: low increase in risk off NC (+2-8 RRU); low increase in risk off FL-SC (0-3 RRU).
	Alt12: low increase in risk off NC (+3-14 RRU); low increase in risk off FL-SC (2-9 RRU).
	Preferred Alt11: low increase in risk off NC (+3-15 RRU); low increase in risk off FL-SC (1-12 RRU).
	Alt5: low increase in risk off NC (+1-2 RRU); low to high increase in risk off FL-SC (11-58 RRU).
	Alt10: low to moderate increase in risk off NC (+6-20 RRU); low to high increase in risk off FL-SC (12-58 RRU).
	Alt8a: low to moderate increase in risk off NC (+6-26 RRU); low to high increase in risk off FL-SC (12-58 RRU).
	Alt3: low to moderate increase in risk off NC (+10-26 RRU); low to high increase in risk off FL-SC (16-52 RRU).
	Alt9a: moderate to high increase in risk off NC (+26-51 RRU); moderate to high increase in risk off FL-SC (30-72 RRU).
	Alt8b: moderate to high increase in risk off NC (+46-50 RRU); high to very high increase in risk off FL-SC (58-77 RRU).
	Alt7c: moderate increase in risk off NC (+46-50 RRU); moderate to high increase in risk off FL-SC (55-76 RRU).
	Alt9b: high increase in risk off NC (+54-63 RRU); high to very high increase in risk off FL-SC (64-83 RRU).
	Alt7b: high increase in risk off NC (+69-74 RRU); high to very high increase in risk off FL-SC (67-94 RRU).
	Alt7a: high increase in risk off NC (+69-74 RRU); very high increase in risk off FL-SC (77-96 RRU).
High	Alt2: very high increase in risk off NC (+100-100 RRU); very high increase in risk off FL-SC (100-100 RRU).
	1-25 RRU = low, 26-50 RRU = moderate, 51-75 RRU= high, 76-100+ RRU = very high

Alternative 1 (No Action) introduces no additional entanglement risk to ESA-listed large whales. 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). The coastal waters of the southeastern United States are the only known calving area for North Atlantic right whales. As many as 243 right whales have been documented in the southeastern United States during a single calving season (P. Hamilton, personal communication, April 11, 2014). Studies indicate that right whale concentrations are highest in the core calving area off Florida and Georgia from November 15 through April 15 (NMFS 2008), but they may occur from North Carolina to Florida from November 1 through April 30 (NMFS 2008). Systematic surveys conducted off the coast of North Carolina during the winters of 2001 and 2002 sighted eight calves, suggesting the calving grounds may actually extend as far north as Cape Fear, North Carolina (McLellan et al. 2004). The amount of time non-calving right whales spend in the southeastern United States is typically less than one month (A. Krzystan, June 2014 SEIT meeting) indicating a steady stream of right whales travel between habitats in the northeastern and southeastern United States during fall, winter, and spring. For example, two right whales tagged off Florida in January 2015 and radio-tracked for more than 24 hours migrated northward, mid-season, within days of being tagged. On rare occasions, right whales have been spotted as early as September and as late as July in the southeastern United States (Taylor et al. 2010). There is also increasing evidence that juvenile humpback whales remain in the Mid-Atlantic during the winter to feed instead of travelling to the Caribbean to breed.

Entanglement in fixed fishing gear is a leading cause of right whale mortality (Knowlton et al. 2012). Rope from trap/pot gear was more frequently found on entangled right whales than rope associated with gillnets when gear from entangled whales could be identified (Johnson et al. 2005). Knowlton et al. (2012) report that approximately 83% of all right whales have been entangled at least once, and 60% of those animals had been entangled multiple times. The authors further clarify that this is a minimum estimate (Knowlton et al. 2012). Based on the current known information about North Atlantic right and humpback whales in the southeastern United States, **Alternative 1 (No Action)** removes temporal and spatial overlap between the black sea bass pot sector and these species; essentially eliminating entanglement risk. Maintaining status quo ensures that no black sea bass pot lines would be in the water when ESA-listed large whales are likely to be in or transiting through waters under the Council's jurisdiction.

Alternative 2 introduces the greatest amount of entanglement risk relative to all the other alternatives. The SERO-LAPP-2014-09 analysis indicates a very high increase in entanglement risk for right whales off North Carolina and from South Carolina to Florida for **Alternative 2**, relative to **Alternative 1 (No Action)**. The very high relative risk associated with **Alternative 2** is because predicted North Atlantic right whale presence is high outside of the spatial boundaries of **Alternative 2**. **Alternative 2** is based on the currently designated North Atlantic right whale critical habitat, designated in the 1994. This area was originally based on 303 sightings from 1950-1989. In the 20+ years since designation, the understanding of where North Atlantic right whales occur, or are most likely to occur, in southeastern United States has grown significantly. The current Right Whale Critical Habitat includes state waters. The SERO-LAPP-2014-09 analysis does not include data from state waters, as the Council does not have authority to prohibit the use of black sea bass pots in state waters. On January 26, 2016, NMFS issued a final rule that created an expansion of the critical habitat area. The South Atlantic Council voted in December 2015 to send this amendment in for U.S. Secretary of Commerce review prior to the publication of the final rule for the North Atlantic right whale critical habitat area expansion.

The following is language describing the North Atlantic right whale critical habitat area from 50 CFR § 226.203(c) used to develop **Alternative 2**:

> *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.*

The following is language describing the North Atlantic right whale critical habitat area from 50 CFR § 226.203(c) as designated on January 26, 2016:

> *Southeastern United States: Includes marine waters from Cape Fear, North Carolina, southward to 28°N latitude (approximately 31 miles south of Cape Canaveral, Florida) within the area bounded on the west by the shoreline and the 72 COLREGS lines, and on*

the east by rhumb lines connecting the following points in the order stated from north to south.

N. Latitude	W. Longitude
33°51' N	at shoreline
33°42' N	77°43' W
33°37' N	77°47' W
33°28' N	78°33' W
32°59' N	78°50' W
32°17' N	79°53' W
31°31' N	80°33' W
30°43' N	80°49' W
30°30' N	81°01' W
29°45' N	81°01' W
29°15' N	80º55' W
29°08' N	80°51' W
28°50' N	80°39' W
28°38' N	80°30' W
28°28' N	80°26' W
28°24' N	80°27' W
28°21' N	80°31' W
28°16' N	80°31' W
28°11' N	80°33' W
28°00' N	80º29' W
28°00' N	At shoreline

Alternative 3 would likely introduce less entanglement risk than many alternatives (i.e., **Alternative 2,** and **Sub-Alternatives 7a, 7b, 7c, 8b, 9a,** and **9b**), but introduce more entanglement risk than others (i.e., **Alternatives 1 (No Action)**, **4**, **5**, **6**, **8a, 10**, **Preferred 11**, and **12)**. The SERO-LAPP-2014-09 analysis indicates a low to moderate increased entanglement risk in right whales off North Carolina, for this alternative, relative to **Alternative 1 (No Action)**. However, that analysis indicates a low to high increased risk of entanglement from South Carolina to Florida for this alternative, relative to **Alternative 1 (No Action)**. **Alternative 3** considers the entire period when ESA-listed large whales may be in the southeastern United States (i.e., November 1 through April 30). However, the increase in relative risk is likely because the area proposed in **Alternative 3** is based on habitat features preferred by pregnant right whales and mother/calf pairs only (Good 2008, Keller et al. 2012). It does not consider juveniles, non-reproducing adults, or account for the north/south migratory behavior of right whales (i.e., whales that may occur outside of predicted areas due to behavioral reasons). Juvenile right whales are the age class most prone to entanglement and entangle at a higher rate (Knowlton et al. 2012).

Alternative 4 likely introduces relatively little entanglement risk relative to almost all of the alternatives. Only **Alternative 1 (No Action)** and **Alternative 6** would introduce less entanglement risk than **Alternative 4**. The SERO-LAPP-2014-09 analysis indicates a low increased risk of entanglement both off North Carolina and from South Carolina to Florida, for

this alternative, relative to **Alternative 1 (No Action)**. The area proposed under this alternative is based on bathymetry, 2005/06-2012/13 right whale Early Warning System data, and South Carolina/Georgia aerial survey data and 2001/02, 2005/06, and 2006/07 surveys by the University of North Carolina-Wilmington (L. Garrison, pers. comm. 2014). These data sources are more expansive and recent than those used to develop the area proposed in **Alternative 3**. These newer data sources are particularly more robust off the state of South Carolina, and include all right whale demographic segments (i.e., mother/calf pairs, pregnant females, non-reproducing females, adult males, and juveniles). This alternative considers the entire period when ESA-listed large whales may be in the southeastern United States (i.e., November 1 through April 30) and captures approximately 97% and 96% of right whale sightings in the North Carolina/South Carolina region and the Florida/Georgia region, respectively.

Alternative 5 introduces lower entanglement risk relative to most of the alternatives (i.e., **Alternatives 2**, **3**, and **10** and **Sub-Alternatives 7a**, **7b**, **7c**, **8a**, **8b**, **9a**, and **9b**) but more than others (i.e., **Alternatives 1 (No Action)**, **4**, **6**, **Preferred 11**, and **12**). The SERO-LAPP-2014-09 analysis indicates a low increased entanglement risk in right whales off North Carolina, for this alternative, relative to **Alternative 1 (No Action)**. However, that analysis indicates a low to high increased risk of entanglement from South Carolina to Florida for this alternative, relative to **Alternative 1 (No Action)**. The area closure for pots proposed off Florida/Georgia under this alternative is based on the right whale calving habitat model that is also the basis for **Alternative 3**. Off the coasts of North Carolina/South Carolina, the closure extends offshore 30 nautical miles. This alternative considers the entire period when ESA-listed large whales may be in the southeastern United States (i.e., November 1 through April 30). However, the increase in relative risk from South Carolina to Florida is the result of estimated commercial black sea bass pot gear effort south and east of the proposed pot area closure from St. Augustine to Cape Canaveral, Florida. This alternative provides less protection in the core calving area because the protected area likely does not extend far enough into South Florida waters to capture the full extent of right whale occurrence based on updated information.

Alternative 6 would likely introduce very little entanglement risk; only **Alternative 1 (No Action)** is expected to have lower entanglement risks**.** The SERO-LAPP-2014-09 analysis indicates a low increased entanglement risk in right whales off North Carolina, and no increased risk from South Carolina to Florida for this alternative, relative to **Alternative 1 (No Action)**. This area represents an existing federal management area, the Southeast Restricted Area for gillnets, under the Atlantic Large Whale Take Reduction Plan (ALWTRP); and an additional area off North Carolina. The area off North Carolina includes waters shallower than 30 meters. This alternative considers the entire period when ESA-listed large whales may be in the southeastern United States (i.e., November 1 through April 30). This area extends substantially further offshore of Florida and Georgia than areas included in other alternatives. Thus, no increase in relative risk to right whales is anticipated off Florida and Georgia and a negligible increase in relative risk is projected off South Carolina.

Sub-Alternative 7a would likely introduce more entanglement risk than all other alternatives except for **Alternative 2**. The SERO-LAPP-2014-09 analysis indicates a high increased entanglement risk for right whales off North Carolina, and a very high increased risk of entanglement for right whales from South Carolina to Florida for **Sub-Alternative 7a**, relative to

Alternative 1 (No Action). The SERO-LAPP-2014-09 analysis indicates a high to very high increased risk of entanglement under **Sub-Alternative 7b** and moderate under **Alternative 7c** in right whales off North Carolina and a high to very high increase from South Carolina to Florida. Each sub-alternative establishes a "book end" closure period for the area off North Carolina/South Carolina and for the area off Florida/Georgia. As noted previously, North Atlantic right whales may be found in the southeastern United States from November 1 through April 30, and do not mass migrate only at the beginning and end of the calving season but rather there is a steady stream of animals traveling between the northeastern and southeastern United States habitats in fall, winter and spring. As a result, the closure periods for black sea bass pots proposed under these sub-alternatives does not cover the entire period when these animals occur in the region. **Sub-Alternative 7c** covers more of the period when North Atlantic right whales would occur in the southeastern United States; however, the commercial black sea bass portion of the snapper grouper fishery is anticipated to reach its ACL soonest under **Sub-Alternative 7a** (somewhere between mid August and early October), followed by **Sub-Alterative 7c** and **Sub-Alterative 7b**. Thus, the SERO-LAPP-2014-09 analysis indicates **Sub-Alternative 7a** would introduce less entanglement risk than **Sub-Alternatives 7c** and **7b**, respectively.

Sub-Alternative 8a would likely introduce less entanglement risk than a number of others (i.e., **Alternatives 2** and **3** and **Sub-Alternatives 7a**, **7b, 7c**, **8b**, **8c**, **9a**, and **9b**), but would likely introduce more than others (i.e., **Alternatives 1**, **4**, **5**, **6**, **10**, **11 (Preferred)**, and **12).** The SERO-LAPP-2014-09 analysis indicates a low to moderate increase in entanglement risk for right whales off North Carolina, and a low to high increased risk of entanglement from South Carolina to Florida for **Sub-Alternative 8a**, relative to **Alternative 1 (No Action)**. Conversely, the SERO-LAPP-2014-09 analysis indicates a moderate to high increased risk of entanglement under **Sub-Alternatives 8b** off North Carolina and a high to very high increase in entanglement risk from South Carolina to Florida. **Sub-Alternative 8a** would likely introduce less entanglement risk relative to **Sub-Alternative 8b** for two primary reasons. As noted previously, North Atlantic right whales may be found in the southeastern United States from November 1 through April 30, and do not mass migrate only at the beginning and end of the calving season but rather there is a steady stream of animals traveling between the northeastern and southeastern United States habitats in fall, winter and spring. The closure under **Sub-Alternative 8a** spans almost the entire period North Atlantic right whales will occur in the southeastern United States; whereas, **Sub-Alternative 8b** establishes a "book-end" closure that does not. The ACL is also projected to be met sooner (between mid-October and mid-December) under **Sub-Alternative 8a** than under **Sub-Alternative 8b** (mid-December or not met at all). The sooner the ACL is met, the less likely pots would be in the water when right whales may be in the region.

Sub-Alternative 9a would likely introduce less entanglement risk than **Alternative 2** and **Sub-Alternatives 7a**, **7b**, **7c**, **8b**, and **9b**, but would likely introduce more entanglement risk than **Alternatives 1**, **3**, **4**, **5**, **6**, **10**, **11 (Preferred)**, **12** and **Sub-Alternative 8a**)**.** The SERO-LAPP-2014-09 analysis indicates a moderate to high increase in entanglement risk for right whales off North Carolina, and from South Carolina to Florida for **Sub-Alternative 9a**, relative to **Alternative 1 (No Action)**. Conversely, the SERO-LAPP-2014-09 analysis indicates a high increased risk of entanglement under **Sub-Alternatives 9b** off North Carolina and high to very high risk from South Carolina to Florida. **Sub-Alternative 9a** would likely introduce less entanglement risk relative to **Sub-Alternative 9b** for two primary reasons. As noted previously,

North Atlantic right whales may be found in the southeastern United States from November 1 through April 30, and do not mass migrate only at the beginning and end of the calving season but rather there is a steady stream of animals traveling between the northeastern and southeastern United States habitats in fall, winter, and spring. The closure under **Sub-Alternative 9a** spans almost the entire period North Atlantic right whales will occur in the southeastern United States; whereas, Sub-**Alternative 9b** establishes a "book-end" closure that does not. The ACL is projected to be met sooner under **Sub-Alternative 9a** (between mid-September and early November) than under **Sub-Alternative 9b** (mid-December or not met at all). The sooner the ACL is met, the less likely pots would be in the water when right whales may be in the region.

Alternative 10 would likely introduce more entanglement risk than some of the alternatives and sub-alternatives (i.e., **Alternatives 1**, **4**, **5**, **6**, **11 (Preferred)**, and **12**); though is likely to introduce less entanglement risk than **Alternative 2** and **Sub-Alternatives 7a**, **7b**, **7c**, **8a**, **8b**, **9a**, and **9b**. The SERO-LAPP-2014-09 analysis indicates a low to moderate increase in entanglement risk for right whales off North Carolina and a low to high increase from South Carolina to Florida for **Alternative 10**, relative to **Alternative 1 (No Action)**. As with other alternatives and sub-alternatives, **Alternative 10** establishes "book-end" closure periods for areas off North Carolina and South Carolina with a no closure period from December 16 through February 14, while establishing a year-round closure off Florida and Georgia. As noted previously, North Atlantic right whales may be found in the southeastern United States from November 1 through April 30, and do not mass migrate only at the beginning and end of the calving season but rather there is a steady stream of animals traveling between the northeastern and southeastern United States habitats in fall, winter and spring. As a result, the "book-end" closure of November 1 through December 15 and February 15 through April 20 off North Carolina and South Carolina is likely to have limited biological benefits. The closure period off Florida and Georgia is likely to be more biologically beneficial, but does not encompass the entire period when North Atlantic right whales will occur in the southeastern United States.

Preferred Alternative 11 would likely introduce relatively little entanglement risk compared to most alternatives (i.e., **Alternatives 2**, **3**, **5**, and **10**, and **Sub-Alternatives 7a**, **7b**, **7c**, **8a**, **8b**, **9a**, and **9b**) but would likely introduce more entanglement risk than **Alternatives 1 (No Action)**, **4**, **6**, and **12**. The analysis found in **Appendix P** indicates a low increased entanglement risk in right whales off North Carolina and from South Carolina to Florida, for this alternative, relative to **Alternative 1 (No Action)**. This alternative is a hybrid of **Alternative 4** and **8a**. **Preferred Alternative 11** would implement a "book-end" closure, closing fishing only from November 1-30 and April 1-30 in the area proposed for closure under **Alternative 8a**. However, it would also implement a much longer closure from December 1-March 31 in the area currently proposed for closure under **Alternative 4**. This alternative provides a protection to whales during the primary "shoulder season" when whales are migrating to and from the calving grounds. As noted previously, North Atlantic right whales do not mass migrate only at the beginning and end of the calving season but rather there is a steady stream of animals traveling between the northeastern and southeastern United States habitats in fall, winter, and spring. As a result, the "book-end" closure may expose some late/early migrating animals to entanglement risk. However, the alternative does provide a high level of protection to the core calving area, including young calves that are likely to persist off Florida throughout the primary calving season.

Alternative 12 would likely introduce less entanglement risk than all alternatives other than **Alternatives 1 (No Action)**, **4**, and **6**. The analysis found in **Appendix P** indicates a low increased entanglement risk in right whales off North Carolina and from South Carolina to Florida, for this alternative, relative to **Alternative 1 (No Action)**. **Alternative 12** essentially "splits the difference" between the western boundaries of **Alternative 4** and **8a**. **Alternative 12** would implement an annual closure for the proposed area from November 1 through April 30. This alternative considers the entire period when ESA-listed large whales may be in the southeastern United States (i.e., November 1 through April 30).

There is uncertainty in the predicted distribution of right whales, especially off North Carolina, where limited data with relatively few sightings are available. However, limited data should not be confused with limited right whale use of the area. Right whales use the mid-Atlantic as a migratory corridor, among other uses such as calving grounds, so right whale presence off North and South Carolina is likely underestimated by visual detection surveys. As previously mentioned, the Atlantic SRG found that the additional model developed for the distribution of right whales off North Carolina was valid and consistent with the expectations of experts on right whale biology.

With respect to non-marine mammal ESA-listed species, **Alternative 1 (No Action)** would perpetuate the existing level of risk for interactions between these species and the snapper grouper fishery. Previous ESA consultations determined the snapper grouper fishery (including the black sea bass pot sector) would have no effect on ESA-listed corals and was not likely to adversely affect any distinct population segments of Atlantic sturgeon. For the species that may interact with the snapper grouper fishery (i.e., sea turtles and smalltooth sawfish), it is unclear how the other alternatives would affect existing levels of risks for fishery interactions with sea turtles and smalltooth sawfish. Both sea turtles and smalltooth sawfish are known to interact with pot/trap gear. Thus, any alternative besides **Alternative 1 (No Action)** is likely to increase the potential risk of entanglement, relative to status quo. Area prohibitions on the use of black sea bass pots are likely to provide some level of biological benefit to these species by reducing the likelihood of interaction between these species and black sea bass pots.

However, the potential for interactions between these species and hook-and-line gear is generally considered greater than for trap/pot gear, because sea turtles and sawfish can be attracted to, and may actively pursue, bait used during hook-and-line fishing. Thus, if black sea bass pot fishermen switch to hook-and-line gear to target black sea bass or other species during proposed pot closures, the likelihood of interactions between the black sea bass portion of the snapper grouper fishery and sea turtles and smalltooth sawfish may actually increase. Similarly, if black sea bass pot fishermen switch to hook-and-line gear to target other species when the ACL is met, then alternatives leading to the black sea bass commercial ACL being caught faster may be less biologically beneficial to sea turtles and smalltooth sawfish. So while this action may have some biological benefits to sea turtles and sawfish by reducing the likelihood of interaction with black sea bass pot gear, the potential likelihood of capture on hook-and-line gear may actually increase.

4.1.2 Economic Effects

Additional economic effects analyses not directly related to the comparison of alternatives for this action are presented in **Appendix I**.

Expected closure date

Table 4.1.1.1 shows the expected closure dates for **Alternatives/Sub-alternatives 1** through **12** for the three pot placement scenarios considered in NMFS (2015a). **Table 4.1.2.1** shows the expected closure dates for **Alternatives/Sub-alternatives 1-12** for pot placement Scenario C (placement for 2006/2007-2008/2009 seasons) assuming that mean conditions exist for each of the four catch rate scenarios.

Table 4.1.2.1. Expected closure dates for each alternative/sub-alternative of **Action 1** using Scenario C (last three complete year around seasons with no closures 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	2-Oct	4-Aug	20-Sep	27-Sep
Alternative 3	26-Nov	4-Oct	26-Oct	19-Nov
Alternative 4	20-Dec	7-Dec	11-Dec	19-Dec
Alternative 5	16-Dec	1-Dec	6-Dec	15-Dec
Alternative 6	20-Dec	7-Dec	10-Dec	19-Dec
Sub-Alternative 7a	11-Oct	18-Aug	6-Oct	7-Oct
Sub-Alternative 7b	No Closure	27-Dec	19-Dec	No Closure
Sub-Alternative 7c	27-Dec	16-Dec	13-Dec	28-Dec
Sub-Alternative 8a	6-Dec	17-Oct	29-Oct	5-Dec
Sub-Alternative 8b	No Closure	28-Dec	20-Dec	No Closure
Sub-Alternative 9a	28-Oct	15-Sep	13-Oct	24-Oct
Sub-Alternative 9b	31-Dec	24-Dec	17-Dec	No Closure
Alternative 10	No Closure	25-Dec	18-Dec	No Closure
Preferred Alternative 11	**18-Dec**	**3-Dec**	**6-Dec**	**17-Dec**
Alternative 12	15-Dec	21-Nov	5-Dec	14-Dec

Because the commercial black sea bass fishing year was changed to start January 1 through the implementation of Regulatory Amendment 14 to the Snapper Grouper FMP (SAFMC 2014), alternatives that would be expected to keep the black sea bass fishing season open until December would be expected to have the highest positive economic effect because historically ex-vessel price per pound tends to be higher than average for black sea bass in winter months. A longer season has additional benefits for fishermen such as better business cash flow and fewer potential economic losses due to regulatory discards (releasing fish while targeting other species). A longer season has economic benefits beyond those realized by fishermen. A longer season would provide for a more steady market supply benefitting processors, fish houses, and restaurants, as well as the consumer.

Expected dockside revenue of the commercial black sea bass sector

The expected changes in dockside revenue under each of the proposed alternatives are provided in **Table 4.1.2.2** and shows the differences in expected dockside values for **Alternative 1 (No Action)** subtracted from each of the **Alternatives 2 – 12** for all four catch rate scenarios based on monthly price per pound calculations for two different time series, 2000 – 2013 landings and 2011 – 2013 landings (**Figure 4.1.2.1**).

Table 4.1.2.2. Expected difference in dockside value of commercial black sea bass (for all gear) under the alternatives of Action 1 compared to **Alternative 1 (No Action)** using two price per pound estimates, the four different catch rate scenarios (**Appendix N**), and estimations of spatial locations of gear based on the 2006/2007-2008/2009 fishing seasons (Scenario C; **Appendix N**).

	Price/lb years	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Alternative 2	2000-2013	$55,579	$41,654	$54,865	$59,233
	2011-2013	$56,344	$43,028	$55,362	$59,967
Alternative 3	2000-2013	$48,666	$57,925	$53,395	$50,417
	2011-2013	$49,040	$58,597	$53,638	$50,776
Alternative 4	2000-2013	$43,849	$44,929	$46,574	$43,207
	2011-2013	$44,042	$45,276	$46,699	$43,393
Alternative 5	2000-2013	$44,747	$48,036	$45,777	$45,404
	2011-2013	$44,967	$48,431	$45,920	$45,616
Alternative 6	2000-2013	$44,488	$45,844	$41,955	$43,936
	2011-2013	$44,682	$46,194	$42,082	$44,123
Sub-Alternative 7a	2000-2013	$54,285	$45,784	$56,192	$57,759
	2011-2013	$55,050	$47,158	$56,690	$58,494
Sub-Alternative 7b	2000-2013	$53,721	$44,771	$55,776	$57,106
	2011-2013	$54,486	$46,144	$56,273	$57,840
Sub-Alternative 7c	2000-2013	$50,866	$48,204	$50,690	$50,188
	2011-2013	$51,631	$49,578	$51,188	$50,923
Sub-Alternative 8a	2000-2013	$43,933	$52,528	$50,096	$46,268
	2011-2013	$44,230	$53,061	$50,288	$46,553
Sub-Alternative 8b	2000-2013	$50,933	$48,325	$50,797	$50,256
	2011-2013	$51,698	$49,698	$51,295	$50,990
Sub-Alternative 9a	2000-2013	$51,312	$55,582	$56,634	$52,214
	2011-2013	$51,812	$56,480	$56,960	$52,694
Sub-Alternative 9b	2000-2013	$54,038	$47,112	$53,751	$55,192
	2011-2013	$54,803	$48,485	$54,248	$55,926
Alternative 10	2000-2013	$50,933	$48,325	$50,797	$50,256
	2011-2013	$51,698	$49,698	$51,295	$50,990
Preferred Alternative 11	2000-2013	$45,640	$43,541	$45,570	$46,367
	2011-2013	$45,834	$43,889	$45,696	$46,553
Alternative 12	2000-2013	$45,723	$48,492	$44,941	$46,941
	2011-2013	$45,956	$48,911	$45,093	$47,165

Figure 4.1.2.1 and **Figure 4.1.2.2** show the expected differences in economic value for each of the alternatives under Scenarios 1 – 4 using each of the price per pound calculation methods.

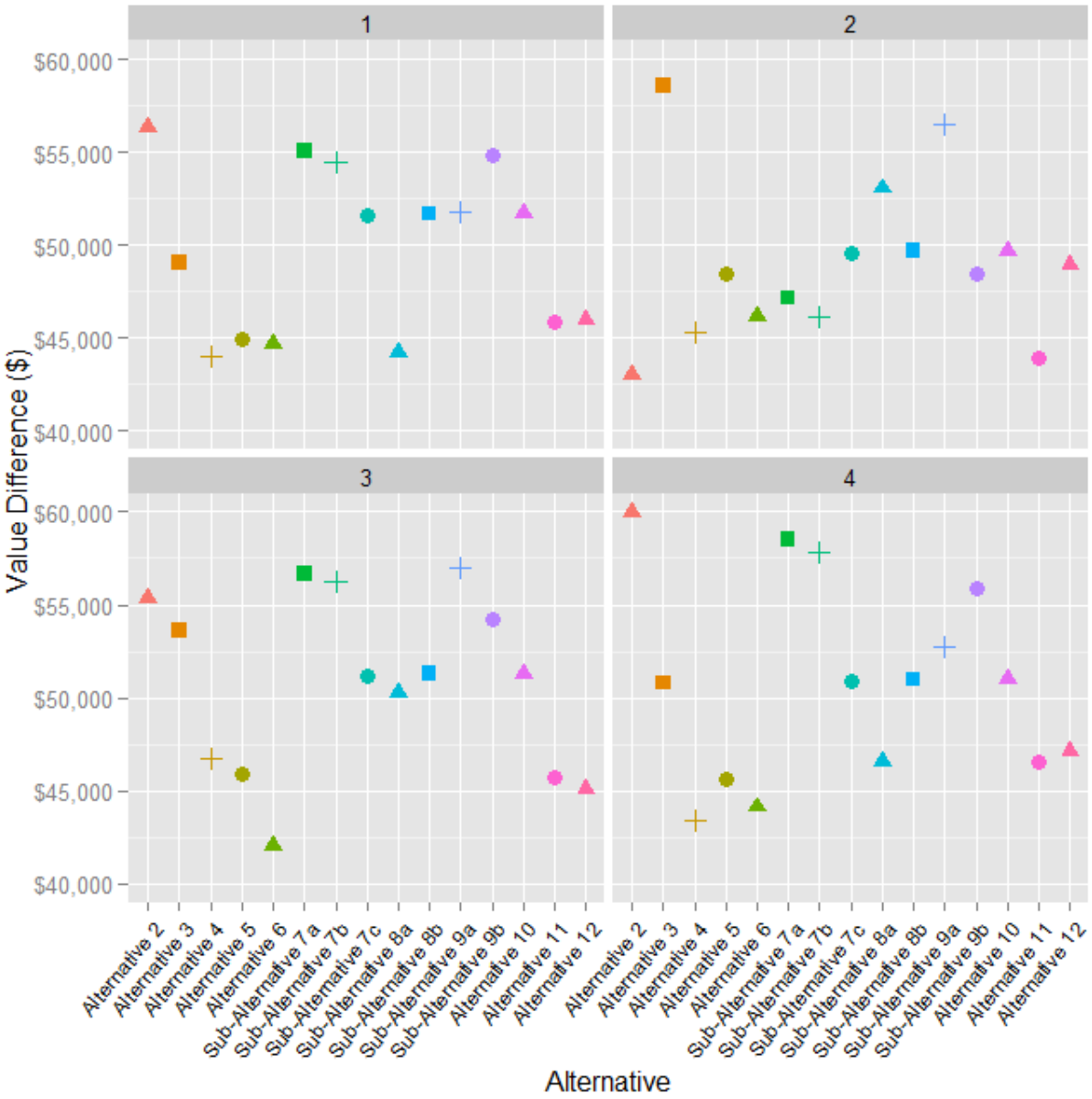

Figure 4.1.2.1. Expected difference in value (in 2013 dollars) between **Alternative 1 (No Action)** and the other Alternatives/Sub-Alternatives by catch rate scenario for **Action 1**, using the monthly price per pound calculations from 2011 – 2013.

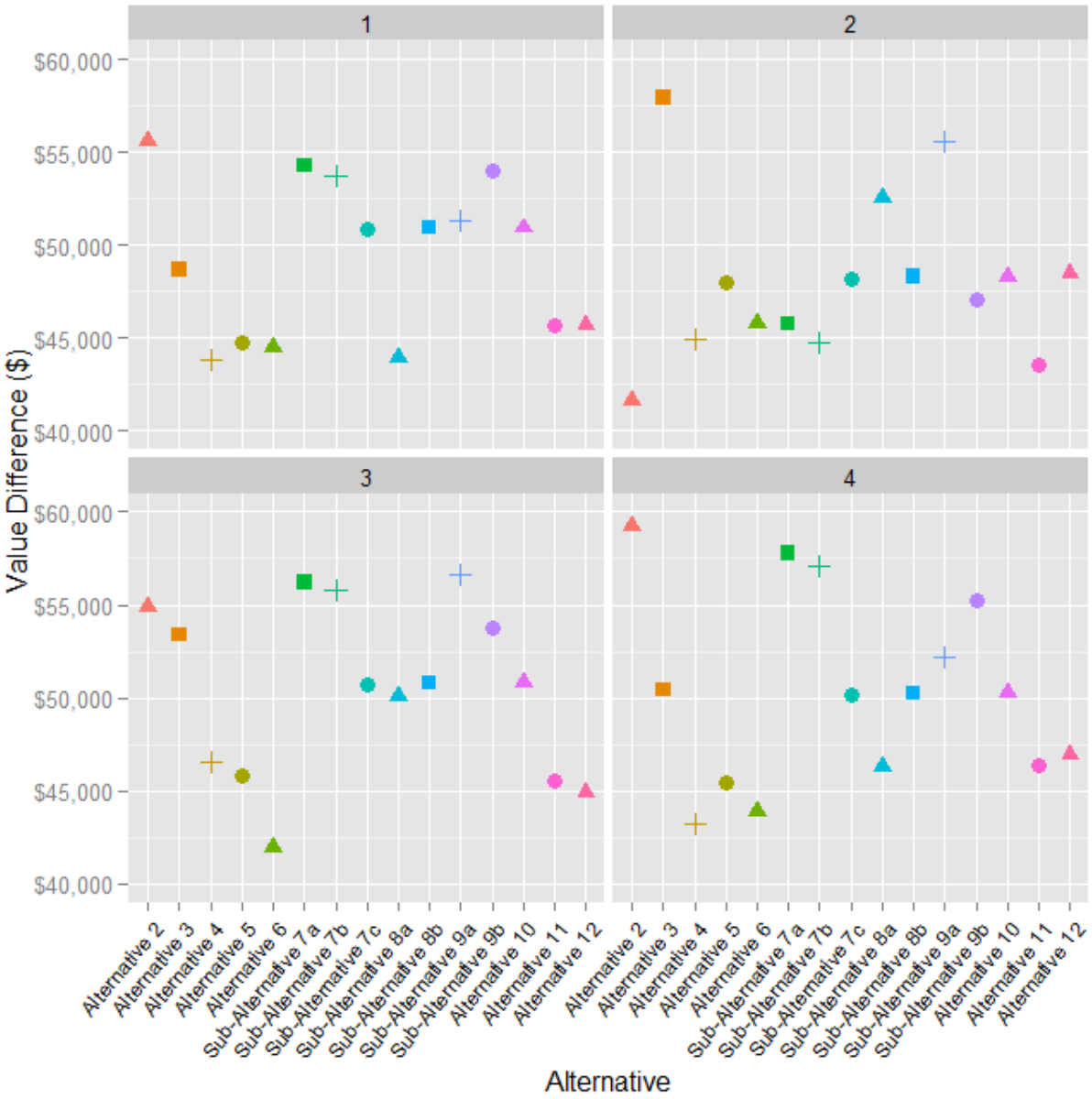

Figure 4.1.2.2. Expected difference in value (in 2013 dollars) between **Alternative 1 (No Action)** and the other Alternatives/Sub-Alternatives by catch rate scenario for **Action 1**, using the monthly price per pound calculations from 2000 – 2013.

The various alternatives and sub-alternatives of **Action 1** shift the balance among the gear that can harvest black sea bass. While **Table 4.1.2.2** showed total expected differences in dockside values for **Alternatives/Sub-alternatives 2-12** compared to **Alternative 1 (No Action)** for each of the four catch rates estimated by NMFS (2015a), **Table 4.1.2.3** shows the same information as **Table 4.1.2.2**, but just for pot landings. **Table 4.1.2.4** shows the same information as **Table 4.1.2.2**, but only for all non-pot gear landings. All alternatives/sub-alternatives increase the total ex-vessel value for landings by pot gear compared to **Alternative 1 (No Action)**. And conversely, all alternatives/sub-alternatives decrease the total ex-vessel value for landings by non-pot gear compared to **Alternative 1 (No Action)**.

Table 4.1.2.3. Expected difference in dockside value of commercial black sea bass (for pot gear only) under the alternatives of **Action 1** compared to **Alternative 1 (No Action)** using two price per pound estimates, the four different catch rate scenarios (**Appendix N**), and estimations of spatial locations of gear based on the 2006/2007-2008/2009 fishing seasons (Scenario C; **Appendix N**).

	Price/lb years	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Alternative 1	2000-2013	$0	$0	$0	$0
	2011-2013	$0	$0	$0	$0
Alternative 2	2000-2013	$261,780	$369,250	$283,094	$274,373
	2011-2013	$343,639	$508,452	$399,154	$361,766
Alternative 3	2000-2013	$201,807	$261,207	$224,566	$206,155
	2011-2013	$272,077	$348,792	$314,732	$273,511
Alternative 4	2000-2013	$102,412	$166,935	$149,059	$106,650
	2011-2013	$146,042	$233,275	$222,747	$151,863
Alternative 5	2000-2013	$122,831	$199,323	$172,663	$128,369
	2011-2013	$172,514	$273,501	$253,120	$179,545
Alternative 6	2000-2013	$103,051	$167,850	$149,320	$107,379
	2011-2013	$146,889	$234,397	$222,815	$152,859
Sub-Alternative 7a	2000-2013	$247,350	$341,461	$256,555	$256,662
	2011-2013	$323,678	$467,735	$358,077	$336,104
Sub-Alternative 7b	2000-2013	$246,786	$340,447	$256,138	$256,009
	2011-2013	$322,937	$466,405	$357,537	$335,244
Sub-Alternative 7c	2000-2013	$226,416	$302,613	$236,457	$230,117
	2011-2013	$293,256	$407,774	$329,799	$297,877
Sub-Alternative 8a	2000-2013	$165,939	$232,457	$209,542	$173,154
	2011-2013	$226,885	$309,276	$296,081	$234,841
Sub-Alternative 8b	2000-2013	$226,483	$302,733	$236,564	$230,185
	2011-2013	$293,337	$407,919	$329,929	$297,958
Sub-Alternative 9a	2000-2013	$219,564	$293,161	$246,780	$226,304
	2011-2013	$286,261	$396,470	$346,140	$294,942
Sub-Alternative 9b	2000-2013	$241,265	$329,109	$254,113	$248,257
	2011-2013	$314,255	$447,983	$354,875	$323,541
Alternative 10	2000-2013	$226,483	$302,733	$236,564	$230,185
	2011-2013	$293,337	$407,919	$329,929	$297,958
Preferred Alternative 11	2000-2013	$113,964	$185,068	$172,456	$119,571
	2011-2013	$163,606	$260,355	$255,322	$170,710
Alternative 12	2000-2013	$128,687	$203,488	$176,707	$134,785
	2011-2013	$179,974	$275,832	$257,983	$187,776

Table 4.1.2.4. Expected difference in dockside value of commercial black sea bass (for non-pot gear only) under the alternatives of **Action 1** compared to **Alternative 1 (No Action)** using two price per pound estimates, the four different catch rate scenarios (**Appendix N**), and estimations of spatial locations of gear based on the 2006/2007-2008/2009 fishing seasons (Scenario C; **Appendix N**).

	Price/lb years	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Alternative 2	2000-2013	($206,201)	($327,596)	($228,229)	($215,140)
	2011-2013	($330,297)	($466,642)	($354,935)	($340,372)
Alternative 3	2000-2013	($153,142)	($203,282)	($171,171)	($155,738)
	2011-2013	($261,531)	($326,791)	($288,226)	($266,061)
Alternative 4	2000-2013	($58,563)	($122,006)	($102,485)	($63,443)
	2011-2013	($99,985)	($208,303)	($174,974)	($108,318)
Alternative 5	2000-2013	($78,084)	($151,287)	($126,886)	($82,964)
	2011-2013	($133,314)	($258,296)	($216,635)	($141,646)
Alternative 6	2000-2013	($58,563)	($122,006)	($107,365)	($63,443)
	2011-2013	($99,985)	($208,303)	($183,307)	($108,318)
Sub-Alternative 7a	2000-2013	($193,065)	($295,677)	($200,363)	($198,903)
	2011-2013	($314,521)	($430,553)	($323,285)	($321,532)
Sub-Alternative 7b	2000-2013	($193,065)	($295,677)	($200,363)	($198,903)
	2011-2013	($314,521)	($430,553)	($323,285)	($321,532)
Sub-Alternative 7c	2000-2013	($175,550)	($254,408)	($185,767)	($179,928)
	2011-2013	($293,485)	($384,062)	($305,756)	($298,744)
Sub-Alternative 8a	2000-2013	($122,006)	($179,928)	($159,447)	($126,886)
	2011-2013	($208,303)	($298,744)	($272,532)	($216,635)
Sub-Alternative 8b	2000-2013	($175,550)	($254,408)	($185,767)	($179,928)
	2011-2013	($293,485)	($384,062)	($305,756)	($298,744)
Sub-Alternative 9a	2000-2013	($168,252)	($237,579)	($190,146)	($174,090)
	2011-2013	($284,720)	($365,338)	($311,015)	($291,732)
Sub-Alternative 9b	2000-2013	($187,226)	($281,997)	($200,363)	($193,065)
	2011-2013	($307,509)	($415,087)	($323,285)	($314,521)
Alternative 10	2000-2013	($175,550)	($254,408)	($185,767)	($179,928)
	2011-2013	($293,485)	($384,062)	($305,756)	($298,744)
Preferred Alternative 11	2000-2013	($68,323)	($141,527)	($126,886)	($73,204)
	2011-2013	($116,650)	($241,631)	($216,635)	($124,982)
Alternative 12	2000-2013	($82,964)	($154,996)	($131,766)	($87,844)
	2011-2013	($141,646)	($264,767)	($224,967)	($149,978)

Given the uncertainty of how fishery participants will change their behavior, each of the four catch rate scenarios are assumed to be plausible estimates of future fishing behavior sufficient to bracket actual pot placement and associated harvest. One way to simplify comparisons between alternatives is to use mean values across the four scenarios for each alternative or sub-alternative. **Table 4.1.2.5** shows the percent of expected ex-vessel revenue of black sea bass landed with pot gear averaged across the four landings scenarios as a percent of the expected black sea bass ex-vessel revenue for all gear types combined. Regardless of whether 2000 – 2013 or 2011 – 2013 prices are used, **Alternative 1 (No Action)** would be expected to result in a lower percentage of the expected total ex-vessel revenue harvested with pot gear than all of the other alternatives/sub-alternatives considered. When using the 2000–2013 prices, **Alternative 2**, **Sub-Alternative 7a**, **Sub-alternative 7b**, and **Sub-Alternative 9b** had the highest expected percentage of total ex-vessel revenues from black sea bass harvested with pot gear. When using the 2011–2013 price per pound values, the comparable alternatives (highest percentage) are **Alternative 2**, **Sub-Alternative 7a**, and **Sub-Alternative 7b**. Any alternative or sub-alternative other than **Alternative 1 (No Action)** would likely result in a greater percentage of the commercial ACL for black sea bass being caught by pot gear and a lower percentage of the ACL being caught by other gear.

Table 4.1.2.5. Mean percentage and ranking of expected ex-vessel value of black sea bass landed by pot gear as a percent of expected ex-vessel value of black sea bass landed by all gear types averaged across the four landings scenarios.

	2000-2013		2011 -2013	
	Mean	Rank	Mean	Rank
Alternative 1	35%	16	31%	16
Alternative 2	55%	1	55%	1
Alternative 3	50%	9	49%	9
Alternative 4	43%	15	41%	15
Alternative 5	45%	12	43%	12
Alternative 6	43%	14	41%	14
Sub-Alternative 7a	53%	2	53%	2
Sub-Alternative 7b	53%	3	53%	3
Sub-Alternative 7c	52%	7	51%	7
Sub-Alternative 8a	48%	10	47%	10
Sub-Alternative 8b	52%	5	51%	5
Sub-Alternative 9a	51%	8	51%	8
Sub-Alternative 9b	53%	4	52%	4
Alternative 10	52%	5	51%	5
Preferred Alternative 11	44%	13	43%	13
Alternative 12	45%	11	44%	11

Table 4.1.2.6 shows the percent of expected ex-vessel revenue of black sea bass landed with non-pot gear averaged across the four landings scenarios as a percent of the expected black sea bass ex-vessel revenue for all gear types combined. Regardless of whether 2000 – 2013 or 2011 – 2013 prices are used, **Alternative 1 (No Action)** would be expected to result in the highest

percentage of the expected total ex-vessel revenue harvested with non-pot gear than all of the other alternatives/sub-alternatives considered. When using the either the 2000–2013 or 2011-2013 price per pound values, **Alternative 4**, **Alternative 6** had the second and third highest expected percentage of total ex-vessel revenues from black sea bass harvested with non-pot gear.

Table 4.1.2.6. Mean percentage and ranking of expected ex-vessel value of black sea bass landed by non-pot gear as a percent of expected ex-vessel value of black sea bass landed by all gear types averaged across the four landings scenarios.

	2000-2013		2011-2013	
	Mean	Rank	Mean	Rank
Alternative 1	65%	1	69%	1
Alternative 2	45%	16	45%	16
Alternative 3	50%	8	51%	8
Alternative 4	57%	2	59%	2
Alternative 5	55%	5	57%	5
Alternative 6	57%	3	59%	3
Sub-Alternative 7a	47%	15	47%	15
Sub-Alternative 7b	47%	14	47%	14
Sub-alternative 7c	48%	10	49%	10
Sub-Alternative 8a	52%	7	53%	7
Sub-Alternative 8b	48%	11	49%	11
Sub-Alternative 9a	49%	9	49%	9
Sub-Alternative 9B	47%	13	48%	13
Alternative 10	48%	11	49%	11
Preferred Alternative 11	56%	4	57%	4
Alternative 12	55%	6	56%	6

Economic effects of relative risk to North Atlantic Right Whales and the black sea bass pot fishery

Potential economic outcomes must be weighed against the chance that a NARW would become entangled in black sea bass pot gear. SERO-LAPP-2014-09 (**Appendix N**) analyzed the potential co-occurrence of black sea bass pot gear and NARW in space and time across the **Action 1** alternatives for a wide variety of potential scenarios (i.e., different assumptions regarding the distribution of pot gear, catch rates, and NARW responses to environmental conditions). In this analysis, co-occurrence was treated as a proxy for relative entanglement risk, an assumption used in other whale risk assessment models (NMFS 2015b; Redfern et al. 2013). The analysis was robust with regards to the differences between alternatives, although the absolute risk of a given alternative cannot be quantified because the entanglement rate of whales in black sea bass pots is unknown.

The **Action 1** alternatives/sub-alternatives can be compared in terms of relative risk as it is operationally defined here. However, the magnitude of the potential relative risk between the alternatives/sub-alternatives in this action cannot be estimated without knowing what the total risk would be if there were no restrictions on using black sea bass pot gear. In this analysis

greater relative risk means the likelihood of entanglements increases when there is more black sea bass pot gear in the water at the same time there is an increase in the presence of whales. In this sense, the alternatives/sub-alternatives can be ranked (e.g., most relative risk to least relative risk); however, the absolute additional amount of risk posed by one alternative/sub-alternative cannot be compared to the absolute amount of risk posed by another alternative/sub-alternative.

Given these caveats for understanding the relative risk, **Figures 4.1.2.3** and **4.1.2.4** show the two separate price per pound time series, the two models used to estimate NARW relative risk from black sea bass pot gear, and the difference between each of the alternatives/sub-alternatives for **Action 1** compared to **Alternative 1 (No Action)**. For Florida through South Carolina, **Alternatives 4** and **6** provide the least relative risk to the NARW while **Alternative 2** provides the greatest relative risk to the NARW (**Figure 4.1.2.3**). For North Carolina, **Alternatives 4 - 6** provide the least relative risk to the NARW while **Alternative 2** provides the greatest relative risk to the NARW (**Figure 4.1.2.4**). Using either the 2000-2013 or the 2011-2013 price per pound estimates, **Alternative 2** has the potential to provide the highest level of ex-vessel value for all the South Atlantic States (**Table 4.1.2.2**).

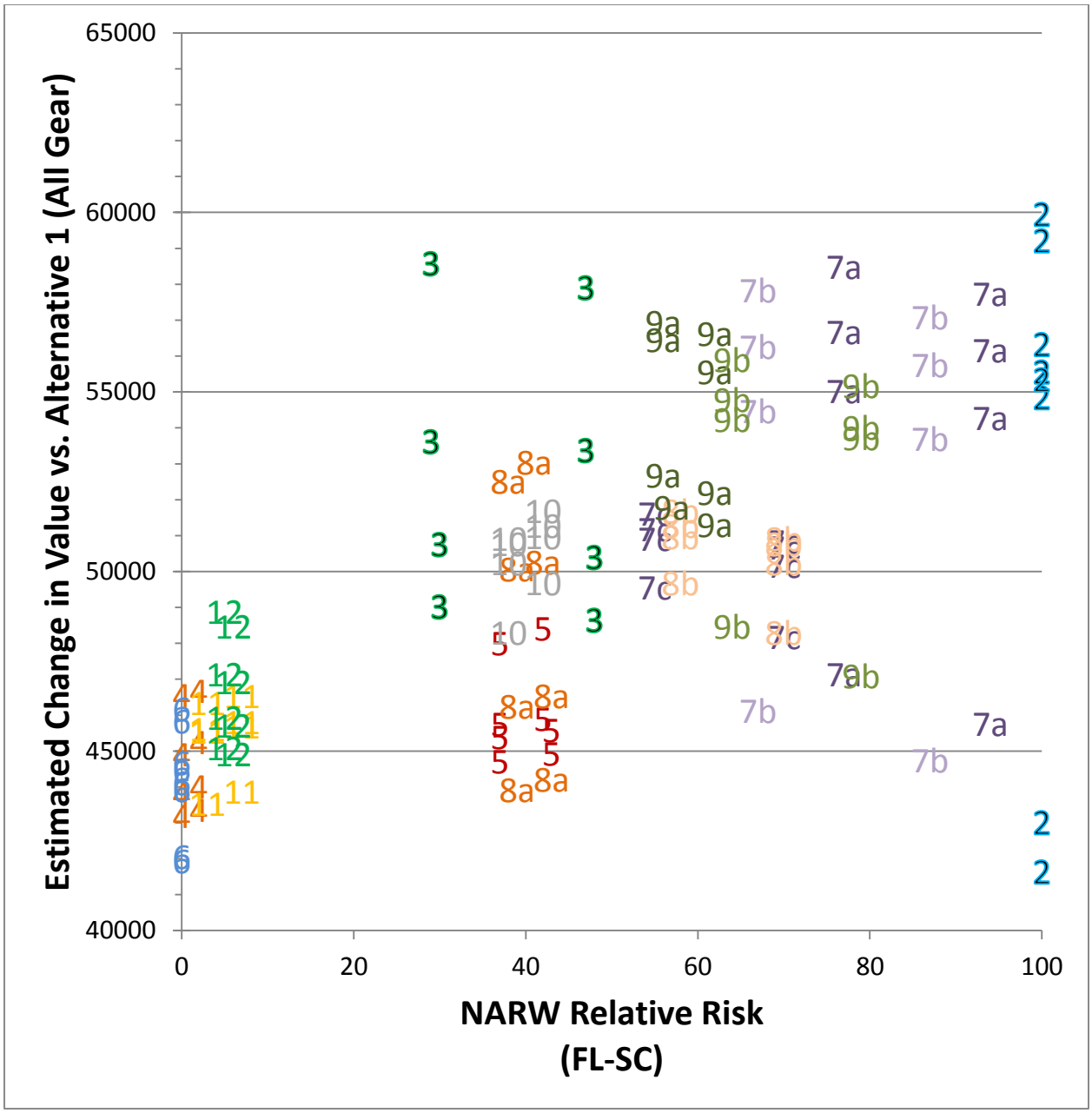

Figure 4.1.2.3. Estimated change in value of commercial black sea bass fishery versus relative right whale risk off FL-SC for spatial closure alternatives proposed in Regulatory Amendment 16.

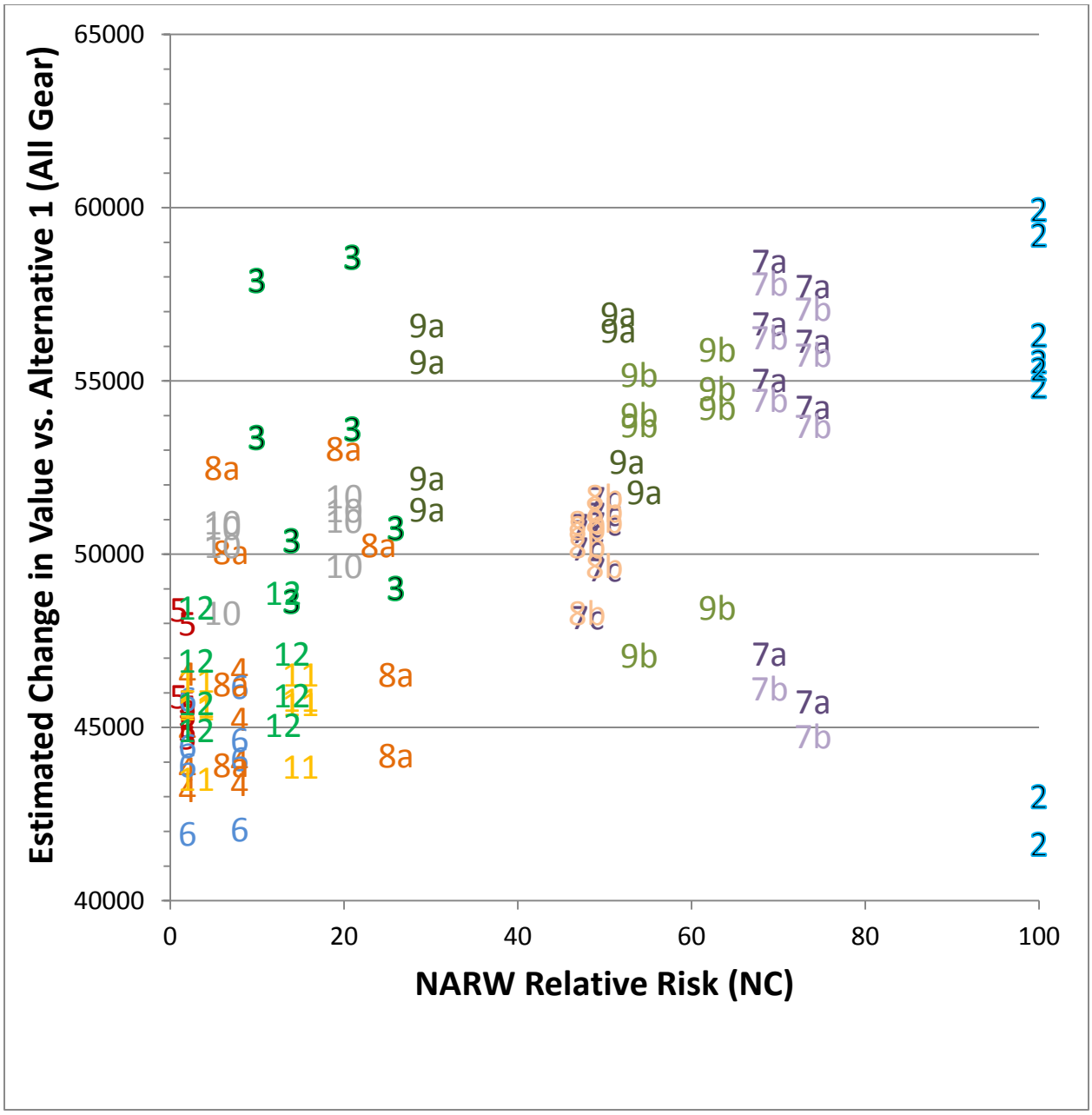

Figure 4.1.2.4. Estimated change in value of commercial black sea bass fishery versus relative right whale risk off NC for spatial closure alternatives proposed in Regulatory Amendment 16.

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 sector, and direct effects on participants in the hook-and-line (and other gear types) sector. 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 portion of the snapper grouper 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 2012), more than half of active pot fishermen did not receive an endorsement and could no longer participate in the pot sector. 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 permit must have had black sea bass landings using black sea bass pot gear averaging at least 2,500 pounds (lbs) 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 using pots to target black sea bass, unless they purchase an endorsement.

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 2013b) 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 to expedite the increase in the black sea bass ACL due to the additional time that would have been required for NMFS to complete an ESA Section 7 consultation for the snapper grouper fishery (SAFMC 2013b) and to meet National Environmental Policy Act requirements.] Additionally, black sea bass pot fishermen are

required to comply with the ALWTRP gear and seasonal requirements (**Tables 1.8.1 – 1.8.5**), which have been in place for the black sea bass pot sector 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 fishing pots for black sea bass in winter 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 the ancillary benefits derived through Amendment 18A (SAFMC 2012).

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 sector 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 N**, 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 sector that contribute to minimizing potential interactions through Council actions and ALWTRP requirements (see **Section 1.8**), the return on investment of additional restrictions such as a spatial/temporal prohibition on black sea bass pot fishing could be low, particularly for the relatively small black sea bass pot sector. Overall, any social benefits that would be expected to result from improved right whale protection would only be realized when biological benefits to the right whales can be measured and demonstrated.

The effects of **Alternatives 2-12** on fishermen and associated communities vary with the temporal and spatial characteristics of the closures, and effects would be different for pot

fishermen and hook and line fishermen. In general, allowing harvest with pots in any way during the winter would be beneficial to pot fishermen, but could have negative effects on all black sea bass fishermen if an increased rate of harvest causes an in-season closure (because the commercial ACL is met). Additionally, allowing pots to be fished during the winter could affect access to the black sea bass commercial ACL for hook and line fishermen, since pots are more efficient gear and could use up more of the commercial ACL.

Depending on the areas that could be closed to pot fishing and actual areas where fishermen place their pots, **Alternatives 2-12** 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**.** However, all possible negative effect due to an earlier in-season closure (because the commercial ACL is met) would be expected under **Alternatives 2-12.** Because of the location of calving areas, there may be less fishing ground available for Florida pot fishermen for most of the winter months (**Alternatives 2-6**, **7b-11 [Preferred]**), except under **Alternative 7/ Sub-Alternative 7a** that would allow fishing in the winter between December 16 through March 14. However, under this sub-alternative, the interaction with adult whales and calves may be more likely, which could result in further fishing restrictions in the future. The alternative(s) with the smallest area that would close potential fishing grounds for Florida pot fishermen would be expected to be the most beneficial to black sea bass pot fishermen in Florida.

For black sea bass pot fishermen in North Carolina and South Carolina, the alternatives with the smallest areas of fishing grounds closed and the shortest period of time would be expected to be the most beneficial. **Alternative 7/ Sub-Alternative 7a, 7b; Alternative 8/Sub-Alternative 8b**; **Alternative 9/ Sub-Alternative 9b**; and **Alternative 10** would allow more time available for harvest with pots in North Carolina and South Carolina than **Alternatives 2-6, 11 (Preferred)** and **12.**

As discussed in **Section 3.3.3**, the black sea bass pot endorsement holders target other species throughout the year. As part of their fishing portfolio, many endorsement holders report that the closure in **Alternative 1 (No Action)** has negative effects on their ability to maximize returns in their overall portfolios. Information collected during the public comment period about the role of fishing pots in winter for the endorsement holders in fishing portfolios and yearly fishing business plans is included in **Appendix L**.

4.1.4 Administrative Effects

Alternative 1 (No Action) would retain the year-long prohibition of fishing with black sea bass pots in the entire South Atlantic region. As such, the alternative would retain the current level of administrative effects. There are logistical and economic costs of monitoring spatial and temporal fishing closures by law enforcement personnel. The costs may be mitigated by public compliance with the regulations. **Alternatives 2-12** would likely result in adverse administrative effects to enforcement compared to **Alternative 1 (No Action)** as these alternatives would specify the pot prohibition in certain areas during certain times. Such changes could make enforcement more difficult. **Alternatives 10** and **12** would likely have the greatest burden of the alternatives to law enforcement as the eastern boundary of the area changes during the year.

4.2 Action 2. Enhance the existing Atlantic Large Whale Take Reduction Plan (ALWTRP) buoy line/weak link gear requirements and buoy line rope marking for black sea bass pots

4.2.1 Biological Effects

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

1. No action. Status quo gear marking requirements.
2. Modify buoy line strength Nov 1 – Apr 30
   2a. less than or equal to 2,200 lbs in federal waters of the South Atlantic.
   2b. less than or equal to 1,200 lbs in federal waters of the South Atlantic.
3. Modify weak links to no more than 400 lbs Nov 1 – Apr 30.
4. **Add a purple 12" color mark adjacent to ALWTRP required line markings from Nov 1 – Apr 30.**

Black Sea Bass

The alternatives range from maintaining the current pot gear requirements (**Alternative 1 – No Action)** to specifying buoy line strength (**Alternative 2**) and decreasing weak link breaking weight (**Alternative 3**) to adding an extra marking on the buoy line (**Preferred Alternative 4**). Regardless of which alternatives or sub-alternatives the 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 annual catch limit (ACL); commercial accountability measures (AMs) are also in place. The ACL, which is based on the ABC, 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 sector 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 or other non-target species. Therefore, there are no biological effects on the black sea bass stock from the alternatives/sub-alternatives in **Action 2**.

Protected Resources

The South Atlantic black sea bass pot sector is listed as part of the larger "Atlantic mixed species trap/pot fishery" under the List of Fisheries (LOF). The National Marine Fisheries Service (NMFS) publishes annually a List of Fisheries (LOF) as required by the Marine Mammal Protection Act (MMPA). The LOF classifies U.S. commercial fisheries into one of three categories according to the level of incidental mortality or serious injury of marine mammals:

I. **frequent** incidental mortality or serious injury of marine mammals
II. **occasional** incidental mortality or serious injury of marine mammals
III. **remote likelihood of/no known** incidental mortality or serious injury of marine mammals.

The classification of a fishery on the LOF determines whether participants in that fishery are subject to certain provisions of the MMPA, such as registration, observer coverage, and take reduction plan requirements.

The black sea bass pot sector is considered a Category II fishery by the NMFS because of its potential to occasionally interact with marine mammals. The Atlantic mixed species trap/pot fishery has had interactions with threatened and endangered species including fin and humpback whales (January 28, 2015; 79 FR 77919). Some pot gear in other areas are Category I fisheries under the LOF, because they frequently cause incidental mortalities or serious injuries of marine mammals. Category I fisheries have been documented to cause serious injury and death to North Atlantic right whales (Johnson et al. 2005, Knowlton et al. 2012). Other trap/pot fisheries are classified as Category III fisheries because there is a remote likelihood of or no known incidental mortality or serious injury of marine mammals.

Entanglements incidental to commercial fishing are the primary threat to right whales; however, less is known about the source of entanglement. In a study of 31 right whale entanglements, Johnson et al. (2005) found 14 cases where gear type could be identified; pot gear represented 71% of these cases (8 lobster pots, 1 crab pot, 1 unknown pot). In a recent compilation of data from 2007-2011, there were 17 entangled whales and none of these were attributed to a specific fishery (Waring et al. 2014). Waring et al. (2014) indicated information from an entanglement event often does not include the detail necessary to assign the entanglements to a particular fishery or location, and scarring studies suggest the vast majority of entanglements are not observed. Consequently, while black sea bass gear has not been definitively identified in entanglements, it also cannot be ruled out as gear that has resulted in serious injuries or deaths to right whales. Knowlton et al. (2015) examined line characteristics of fishing gear removed from live and dead entangled whales from the U.S. East Coast and Canada from 1994-2010. Of 132 ropes from 70 cases, they found 26% of ropes were in the range of 0.312 in (~5/16 in) to 0.654 in (11/16 in) diameter and made out of polypropylene (Knowlton et al, in press). Levesque (2009) interviewed 42 black sea bass pot fishermen from major fishing ports in the area from Georgia through North Carolina. Fishermen reporting using 1/4 in, 5/16 in, or 3/8 in diameter buoy lines and most used polypropolene line (Levesque 2009).

Knowlton et al (in press) suggest that if buoy line breaking strength was 1,700 lbs or less, the number of life-threatening entanglements to large whales would be reduced substantially. However, this is not the case for smaller whales. Eight minke whales (relatively small body sizes to other large whale species) were included in the study and all had died presumably because they could not break free from the entangling gear (Knowlton et al, in press). The breaking strength of rope removed from minke whales ranged from 650 lbs to 3,780 lbs. Very young right whale calves are smaller and weaker than minke whales so line breaking strength would need to be less than 600 lbs to potentially allow right whale calves to break free of the gear (Knowlton et al. 2015).

NMFS tested the breaking strength of number 8 and number 10 Osprey lines, based on information indicating that Florida black sea bass pot fishermen were using primarily number 8 and number 10 Osprey line (T. Burgess, pers. comm. 2015). The testing concluded the maximum breaking strengths were 1,475 lbs and 2,218 lbs, respectively.

Buoy line diameter used off North Carolina was significantly larger than line used off South Carolina or Georgia (Levesque 2009). The majority of fishermen using black sea bass pots in North Carolina report using 5/16 in diameter line (T. Burgess, pers. comm. 2015).

Compared to **Alternative 1 (No Action)**, **Alternative 2** is likely to maintain (**Sub-alternative 2a)** or slightly reduce (**Sub-alternative 2b)** the overall breaking strength of line used in the commercial black sea bass pot sector throughout the Council's jurisdiction. Reduced line breaking strength can be less life threatening to large whales than lines with higher breaking strength if line breaking strength is below the threshold at which whales can safely break free from the lines. Knowlton et al (in press) suggest that if buoy line breaking strength was 1,700 lbs or less, the number of life-threatening entanglements to adult large whales may be reduced substantially. **Sub-Alternative 2a** (maximum line strength of 2,200 lbs) would likely maintain the breaking strength of lines currently being used and would have limited, if any, benefits for listed whale species. **Sub-Alternative 2b** (maximum line strength of 1,200 lbs) would likely result in fewer life-threatening entanglements for humpback whales and juvenile and adult right whales. The breaking strength in both **Sub-Alternative 2a** and **Sub-Alternative 2b** is greater than strength from which minke whales are able to escape. Given that very young right whale calves are smaller and weaker than minke whales, the breaking strength of both sub-alternatives is also likely greater than what young calves could shed. Consequently, **Sub-Alternative 2b** would not be expected to provide any less risk from entanglement to very young right whale calves than **Sub-alternative 2a**.

The biological impacts from **Alternative 3** on ESA-listed whales is unclear, but are likely beneficial. Weak links break apart when enough opposing pressure is applied to the either side of the link. On pot gear, weak links are installed where the surface buoy attaches to the buoy (vertical) line. When the weak link breaks, it releases the buoy from the vertical buoy line and attached pot. A benefit of releasing the buoy is that the remaining entangling line will then be free to slide through baleen or over/around flippers and be shed by a free swimming whale. Weak link provisions are likely to reduce entanglement risk relative to lines without weak links because the buoys can break away allowing the remaining gear to be potentially shed by the whale. A breaking strength of 400 lbs may be low enough to be broken by very young right whale calves. However, since adequate opposing pressure must be applied to the weak link to break the link, it is unclear how effective this measure would be on a case by case basis.

Preferred Alternative 4 provides a mechanism to identify the black sea bass pot sector if a line entangles a whale. There are no direct biological benefits from **Preferred Alternative 4**; however, any information gained from entangled whales on fishery type, entanglement location, and entanglement date is important to assess the impacts of a fishery and better understand and possibly work towards reducing future entanglements. However, not all gear remains on the individual after an interaction occurs. Furthermore, many entangled right whales are never seen nor is gear recovered. For line markings to be effective, the gear must be recovered, and the recovered gear must retain the marks. Line markings do improve the chances of identifying recovered gear, particularly as the number and size of marks increases. This alternative provides a mechanism to identify the black sea bass pot sector 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 (http://www.greateratlantic.fisheries.noaa.gov/protected/whaletrp/docs/2015-12869.pdf).

None of these alternatives would reduce the potential of interaction between a black sea bass pot and ESA-listed whales. The likelihood of entanglement with right whales is primarily affected by the number of pots in the water and what time of year and where they are fished. A line's breaking strength and weak link's breaking strength has no influence on those factors. Thus, selecting **Alternative 2** and/or **3** is unlikely to have any influence on the overall number of potential interactions. However, **Alternatives 2** and **3** could reduce the potential of serious injury or mortality and potentially identify or eliminate the black sea bass pot sector as a gear with an entanglement (**Preferred Alternative 4**) if the pot sector were to begin operating during November 1-April 30.

4.2.2 Economic Effects

Alternative 2, Sub-Alternative 2a would require minimum line breaking strength of 2,200 lbs for North Carolina, which the ALWTRP already requires for South Carolina, Georgia, and Florida (**Alternative 1 – No Action**). A typical black sea bass pot buoy line is 100 to 130 feet in length (Jack Cox, pers. comm.) Assuming all 17 North Carolina fishermen with black sea bass pot endorsements have 35 pots and need to replace all the buoy lines, at 125 feet per pot, the cost to buy four bundles of line would be $716 (5 bundles x $179/bundle = $895, with each bundle having 1,000' of line and with 35 pots x 125 feet = 4,350' buoy line would be needed). The total expected maximum cost associated with **Alternative 2, Sub-Alternative 2a** is $12,172 (17 x $716). It is not known how many black sea bass pot fishermen currently use buoy line with a breaking strength less than 1,200 lbs as proscribed by **Sub-Alternative 2b**. The worst case scenario is that all 32 endorsement holders would have to buy new buoy line at $149 per 1,000 foot bundle, or $745, assuming fishermen would attach 125 feet of buoy line to each pot (35 pots x 125' = 4,350' buoy line). The total expected maximum cost associated with **Sub-Alternative 2b** is $23,840.

Alternative 3 would require a step-down from 600 to 400-lb in weak link strength. 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 $65 (35 pots x $1.85 per weak-link). The total cost for **Alternative 3** for all endorsement holders would therefore be expected to be $2,080 (32 x $65) if specifically-made weak links are added to each pot. Some fishermen choose to set up their gear using hog rings to act as the weak link. To reduce to a 400-lb weak link, the fishermen would simply need to remove the number of hog rings necessary to reduce the breaking strength down to a 400-lb maximum. A potential side effect of this step-down in weak-link strength could be an increased probability of the links breaking and resulting in gear loss.

While it is unknown what the rate of lost gear might be should the Council choose any alternative/sub-alternative of **Action 2** as preferred alternatives/sub-alternatives, the cost to replace lost gear can be estimated. Two active black sea bass pot fishermen estimated their replacement costs for an entire pot assembly (Jack Cox pers. comm., May 7, 2015; Tom Burgess, pers. comm., May 10, 2015). The following are the estimated costs for replacement:

Pot: $38.50 - 50
Buoys: $4 - 20
Iron weights: $5 - 7
Line: $10 - 40
Weak links: $0 - $1.85 ($0 assumes the fisherman will remove hog rings)
Floy tags: $1.50 – 1.85
Shipping cost for equipment: $10
One hour of labor to assemble a single pot: $23.

Based on these estimates, the range of cost to replace a single lost black sea bass pot runs from approximately $92 to $154.

Preferred Alternative 4 would require fishermen to mark three 12 inch 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 buoy lines for 35 pots. The cost for a quart of marine buoy paint is $47.35. The total maximum cost associated with **Preferred Alternative 4** if all endorsement holders marked their lines with paint is $1,515 (32 x $47.35). Some fishermen have reported that they mark their lines by weaving in surveyor's tape. Checking various sources online (www.amazon.com, www.uline.com/BL_6423/Flagging-Tape, and www.tigersupplies.com) show that rolls of 300 foot of surveyor's tape costs $3 - $11 per roll. This analysis assumes that three 12 inch strips per pot would come out to 105 feet (12 inches per strip x 3 strips per line x 35 pots) to initially equip each pot line. Therefore, if an endorsement holder decided to use surveyor's tape to mark lines, one roll would be sufficient. If all endorsement holders used surveyor's tape, the total cost would be between $96 (32 x $3) and $352 (32 x $11).

4.2.3 Social Effects

In general, the social effects of additional gear specifications would be associated with the economic effects and burden on black sea bass fishermen, and with broad social benefits that could occur with improved protection for right whales. **Sections 3.3.3** and **3.3.4** provide detailed information about the social environment for the black sea bass portion of the snapper grouper fishery. 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.

As discussed in **Section 4.2.2**, there could be some economic costs for fishermen if gear specifications require purchase of additional line and marking supplies. This could affect business cost decisions, which may have some negative effects on crew and associated shoreside support. Under **Alternative 1 (No Action)**, these effects would not be expected because the black sea bass pot fishermen are already required to have the ALWTRP gear specifications. Changing the specified breaking strength under **Alternative 2** - **Preferred Alternative 4** would likely increase business costs for some black sea bass pot fishermen by requiring new gear to meet the requirements. The time periods specified in **Sub-Alternative 2a** and **Sub-Alternative 2b** would likely have similar effects on black sea bass pot fishermen, because if the breaking strength or gear marking is required in only one part of the year (**Sub-alternative 2a**) it would

likely be as much of a burden in terms of requiring new or additional gear purchases as a year-round requirement (**Sub-alternative 2b**). Changing the specified breaking strength under **Sub-alternative 2a** would have the same effects on fishermen and communities in Florida, South Carolina, and Georgia as under **Alternative 1 (No Action).** However, **Sub-alternative 2a** would be expected to have some impact on black sea bass pot fishermen working in North Carolina because different gear would be required. **Sub-alternative 2b** would be expected to affect all black sea bass pot fishermen by increasing gear costs. The gear marking requirement in **Preferred Alternative 4** may be beneficial to the black sea bass pot fishermen by allowing NMFS to better identify gear associated with entanglements, which could help decipher entanglements with gear from other fisheries from black sea bass pot gear.

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. The social benefits would be tied to any benefits for right whale protection, as discussed in **Section 4.2.1**. If the biological benefits and contribution to right whale protection are higher, the broad social benefits associated with protected species conservation would be higher. However, because information on actual risk of interaction is unknown, any associated social benefits would also be unknown. With all other regulations and management measures in place for the black sea bass pot sector that contribute to minimizing potential interactions through Council actions and ALWTRP requirements (see **Section 1.8**), the return on investment of additional gear specifications under **Alternative 2 - Preferred Alternative 4** could be low, particularly for a relatively small fishery such as the black sea bass pot sector. Overall, any social benefits that would be expected to result from improved right whale protection would only be realized when biological benefits to the right whales can be measured and demonstrated.

4.2.4 Administrative Effects

Under **Alternative 1 (No Action)**, commercial black sea bass fishermen are required to abide by the pot configuration restrictions, pot escape mechanism requirements, and pot construction and escape mechanism requirements contained in 50 CFR § 622.189. As such, the alternative would retain the current level of administrative effects. There are logistical and economical costs of monitoring gear requirements. **Alternatives 2** and **3** would change the current requirements and could increase administrative costs, in the short-term, as law enforcement personnel adapt to the changes. **Preferred Alternative 4** would require unique line markings for those using black sea bass pots; this alternative may decrease adverse administrative effects compared to **Alternative 1 (No Action)** as it would be easier for law enforcement personnel to identify black sea bass pots.

Chapter 5. Council Conclusions

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

5.1.1 Snapper Grouper Advisory Panel (AP) Comments and Recommendations

From their November 2013 meeting

South Atlantic Fishery Management Council (Council) staff reviewed alternatives to address the proposed annual closure of black sea bass pots from November 1 to April 30. Regulatory Amendment 19 to the Snapper Grouper FMP implemented this regulation as well as an increase to the black sea bass annual catch limit (ACL.) The AP discussed the feasibility of the November-April black sea bass pot prohibition 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 North Carolina 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.

Action 1 Alternatives[1]

(preferred alternative 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 Daytona Beach to Savannah and 30 m or shallower from Savannah to C. Hatteras.
5. Closure from Nov 1 – April 30 between Daytona Beach & 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. Off FL/GA same as Alt 5. Off SC/NC < 25 m.
   8a. Closure Nov 1 – Apr 15.
   8b. FL/GA closure Nov 15 – Apr 1 SC/NC closure Nov 1 – Dec 15 and Feb 15 – Apr 30.
9. Off FL/GA same as Alt 5. Off SC/NC < 20 m.
   9a. Closure Nov 1 – Apr 15.
   9b. FL/GA closure Nov 15 – Apr 15. SC/NC closure Nov 1 – Dec 15 and Feb 15 – Apr 30.
10. Off FL/GA same as Alt 5 with closure Nov 15 – Apr 15. Off SC/NC Nov 1 – Dec 15 < 20 m. Off SC/NC Feb 15 1 – Apr 30 < 25 m.
11. **Nov 1 – 30 and Apr 1 - 30 off FL/GA same as Alt 5, off SC/NC same as Alt 8. Dec 1 – Mar 31, off FL/GA closure < 25 m, off SC/NC closure < 30 m.**
12. Nov 1 – Apr 30, midpoints between proposed closure Alts 4 and 8.

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

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 AP comment. 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. North Carolina 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.

From their April 2015 meeting

After reviewing the analyses, the Snapper Grouper AP made the following motions regarding Regulatory Amendment 16:

MOTION: THE SG AP SUPPORTS THE COUNCIL'S CHOSEN PREFERRED ALTERNATIVE 9/SUB-ALTERNATIVE 9A.

APPROVED BY AP

Alternative 9. The black sea bass pot closure applies to waters inshore of points 1-28 listed in **Table 2.1.7**; approximately Daytona Beach, Florida, to Cape Hatteras, North Carolina **(Figure 2.1.9)**.

> **Sub-alternative 9a.** The black sea bass pot closure applies to the area annually from November 1 through April 15.

5.1.2 Law Enforcement Advisory Panel (LEAP) Comments and Recommendations

From their March 2014 meeting

The 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 LEAP received a general overview of the alternatives proposed under Regulatory Amendment 16 and made the following recommendations:

- Keep number of waypoints to a minimum.
- Effective enforcement is dependent on few waypoints and straight lines. The more waypoints there are, the more opportunity for error and it may also complicate prosecution.

5.1.3 Scientific and Statistical Committee Comments (SSC) and Recommendations

From their October 2014 meeting

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.*

From their April 2015 meeting

The SSC reviewed and discussed the revised analyses of RA16 alternatives provided by Dr. Nick Farmer. Regarding the three action items listed above the SSC provides the following recommendations:

- *The revised analyses addressed concerns raised by the SSC during the Oct 2014 meeting.*
- *The SSC agrees that this analysis should be considered BSIA.*
- *The SSC agrees that the analysis only characterizes the co-occurrence of whales and black sea bass pots as relative risk, not actual risk or percent risk of entanglement.*

The Socio-economic Panel (SEP) of the SSC met prior to the full SSC meeting. The SEP made the following recommendations based on specific questions asked regarding the two actions in the amendment:

Action 1

Specific Questions:

1. Two time frames were used to calculate price per pound by month (ref. Figure 4.1.2.1). Would it be beneficial to include other time frames?

   No. The SEP felt that no additional price analysis with other time frames is necessary. Additional analysis might add some variation but it would not be enough to change recommendations.

2. Table 4.1.1.1 uses information from an analysis by the Southeast Regional Office (SERO) that projects expected closure dates under various scenarios. Where there is a range of closure dates, it is due to estimated closure dates based on differences between three different scenarios that were used to calculate pot placement for each month. The analysis used for the economic effects only used one of the three modeled scenarios for where pots would be placed. Is there value in repeating the analyses for the other two pot placement scenarios?

   No. Additional analysis using other pot placement scenarios is not necessary because the SEP felt that there would probably be not much variation.

3. Are there additional social or economic analyses that the SEP recommends be completed for this action?

   The SEP recommends that additional economic analysis be considered.
   a. *For the price analysis, the SEP recommends using regression analysis to model the effects of regulatory measures in addition to temporal patterns. This may allow a more refined simulation of future regulatory measures, especially if price variation by market grade (fish size) can be incorporated.*
   b. *To consider efficiency, the SEP recommends predicting a change in the number of trips and change in predicted landings at the pot level and or trip level, especially seasonally. A more sophisticated analysis would model the trip-level decision process that also considers substitute target species but this could involve substantial effort.*
   c. *To incorporate changes in fishing costs, the SEP recommends considering a potential change in trip costs (e.g., due to a change in predicted landings) and vessels needing to travel further distances (e.g., by calculating the change in distance and a standard estimate of additional fuel costs required).*
   d. *Consider addressing the risk associated with expected returns, including localized depletion issues on other sectors of this fishery (e.g., recreational and commercial hook and line) and potential user conflicts with the recreational sector since the pot fishery has switched to the summer and early fall seasons, which is the time when recreational effort is generally at its highest level.*

Note: Regarding a. above, regression analysis was completed. A discussion of market grade is now included in the analysis; however, market grade was only available from the North Carolina trip ticket program and could not be included in the overall black sea bass Southeast logbook landings and therefore market grade could not be included in the regression analysis. Sufficient data do not exist to complete recommended analyses b. and c. above. A qualitative discussion of the potential impacts of localized depletion and potential user conflicts is discussed in Section 4.1.3.

4. What additional recommendations does the SEP have for **Action 1**?
*The SEP had no additional recommendations for **Action 1**.*

5. Does this analysis represent BSIA?
Yes. The SEP feels that this is the BSAI, but are interested in sensitivity analysis resulting from investigating variation in seasonal prices, prices by fish size and additional ways to capture

changes in trip efficiency. Additional sensitivity analysis is not likely to fundamentally change the results of the economic analysis. But, additional sensitivity analysis would provide more confidence in the results.

Note: Additional sensitivity analyses in the form of ANOVA and simple linear regression analyses are now included in the economic effects analysis for **Action 1** (Section 4.1.2).

5.1.4 Public Comments and Recommendations

Public comments for Snapper Grouper Regulatory Amendment 16 were taken in August of 2015. In-person public hearings were held at three locations: Little River, South Carolina on August 11, 2015; Jacksonville, North Carolina on August 12, 2015; and Ormond Beach, Florida on August 17, 2015. Written public comments were accepted by U.S. mail, facsimile, or email until August 21, 2015.

A total of 11 comments were received. There were seven comments given at the public hearings and four comments were submitted by email.

All of the commenters who appeared in person urged the Council to make provisions to allow black sea bass pot gear in some format from November through April each year. Commenters acknowledged keeping pot gear away from whales was a good idea, not just for the whales, but for fishermen, too.

Highlights of public hearing comments:

- Reasonable allowable fishing areas differ by region.
- Florida-based black sea bass pot fishermen could fish beyond 20 meters depth and be away from whales and still catch black sea bass in pots November through April.
- North Carolina-based black sea bass pot fishermen have very few days they can fish from January through April because the weather is too rough. The further out they have to go to fish, the less likely they will be able to make a trip.
- There was no absolute consensus from North Carolina pot users on the depth they need to be able to fish. All agreed that 20 meters depth was doable, but there was less consensus among public hearing attendees regarding other depths. There was no support for a 30-nautical mile from shore closure (**Alternative 5**) off the Carolinas. Weather during that time of year and the fact that the fish tend to school closer to shore in winter makes fishing at that depth impracticable.
- Pot fishermen want to catch black sea bass November through April because the fish are of higher quality and easier to catch in pots during that time of the year.
- Public hearing attendees tended not to endorse specific alternatives for **Action 1**. They endorsed specific depth closures by area.

Four written comments were received (including one from a person who also spoke at one of the public hearings). Below is a summary of those written comments.

- Recommendation to use VHF radio to warn fishermen and other boaters when endangered mammals such as North Atlantic right whales (NARW) are seen.

- The potential hazard to NARWs has been greatly reduced since the requirement of pot endorsements was introduced. Participation in the black sea bass pot sector was capped at 32 participants with no more than 35 pots. Most of the fishermen are using fewer than 35 pots now.
- The Southeastern Fisheries Association, East Coast Fisheries Section, for **Action 1** endorsed **Alternative 9, Sub-Alternative 9a** citing the fact this alternative/sub-alternative provides continued protection for NARWs and allows fishermen to use pots.
- A joint written comment from The Humane Society of the U.S., Whale and Dolphin Conservation, Center for Biological Diversity, Defenders of Wildlife, Mason Weinrich, and Carolyn Good stated their position for retaining the current closure, **Action 1, Alternative 1 (No Action)**. Their objections included what they see as problems with the document development, changing purpose and need for the actions, the imperative to protect NARWs in their only known calving grounds, the need to do whatever is possible and necessary to protect NARWs, shifting economic effects from other gear to pot gear, and size of the economic gain by shifting landings to the pot sector. Should the Council choose an alternative other than **Action 1 (No Action)**, the letter writers urged the Council to choose from among the other alternatives that would have the least risk of an interaction between NARWs and pot gear, namely, **Alternatives 4**, **6**, **11**, or **12**.

Additional public comment outreach was conducted to solicit input from each of black sea bass pot endorsement holders in August and September 2015. The outcome of those interviews is located in **Appendix L**.

5.1.5 Council Choice for Preferred Alternative

The Council chose **Preferred Alternative 11** as its preferred alternative. The Council's main determinants in choosing its preferred alternative was to insure NARWs were protected while allowing fishing using pot gear, as much as possible. The Council determined that **Alternative 1 (No Action)** would not be the best alternative because the status quo unfairly prohibits all black sea bass pot fishing from November 1 through April 30 even in areas where NARW are not present. Initially, the Council had chosen **Alternative 9**, **Sub-alternative 9a** as its preferred alternative/sub-alternative. However, subsequent analysis (see **Table 4.1.1.3**) indicated **Alternative 9**, **Sub-alternative 9a** posed too great a risk of entanglements to NARWs. The Council ultimately determined the preferred alternative is the best management strategy based on **Preferred Alternative 11** prohibits black sea bass pot fishing from areas where 96% to 97% of the known sightings of NARWs occurred from November 1 through April 30 and allows black sea bass pot fishing outside the closed area. Among the alternatives/sub-alternatives with low risk for entanglement with NARWs and allowed for year around fishing using pot gear, **Preferred Alternative 11** had among the highest economic and social benefit (see **Tables 4.1.1.3** and **4.1.2.2)** compared to **Alternative 1 (No Action)**.

The Council concluded **Preferred Alternative 11** best meets the purpose and need, the objectives of the Snapper Grouper FMP, as amended, while complying with the requirements of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) and other applicable law.

5.2 Action 2. Enhance the existing Atlantic Large Whale Take Reduction Plan (ALWTRP) buoy line/weak link gear requirements and buoy line rope marking for black sea bass pots

5.2.1 Snapper Grouper AP Comments and Recommendations

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

1. No action. Status quo gear marking requirements.
2. Modify buoy line strength Nov 1 – Apr 30
   - 2a. less than or equal to 2,200 lbs in federal waters of the South Atlantic.
   - 2b. less than or equal to 1,200 lbs in federal waters of the South Atlantic.
3. Modify weak links to no more than 400 lbs Nov 1 – Apr 30.
4. **Add a purple 12" color mark adjacent to ALWTRP required line markings from Nov 1 – Apr 30.**

[1]See Chapter 2 for a more detailed description

From their April 2015 meeting

The Snapper Grouper AP made the following motions regarding Regulatory Amendment 16:

MOTION: SG AP RECOMMENDS COUNCIL REQUIRE BLACK SEA BASS POT GEAR MARKING BE A SEPARATE COLOR FROM ANY OTHER VERTICAL LINE FISHERY IN THE REGION YEAR AROUND.
APPROVED BY AP

MOTION: SG AP RECOMMENDS RESEARCH BE DONE TO DETERMINE PROPER VERTICAL LINE AND WEAK LINK STRENGTH FOR THE BLACK SEA BASS POT FISHERY IN THE SOUTH ATLANTIC IN ORDER TO MAKE FUTURE RECOMMENDATIONS.
APPROVED BY AP

MOTION: RECOMMEND THE COUNCIL RESEARCH DIFFERENT MESH SIZES FOR BLACK SEA BASS POTS.
APPROVED BY AP

The AP's suggested a mesh size modification for black sea bass pots to 2 inches or 2 3/8 inches to minimize or eliminate discards if the minimum size for commercially harvested black sea bass were to increase from 11 inches to 12 inches.

5.2.2 Law Enforcement Advisory Panel Comments and Recommendations

From their March 2015 meeting

The LEAP received a general overview of the alternatives proposed under Regulatory Amendment 16 and made the following recommendations:

- The LEAP defers to the ALWTRP for recommendations on Action 2.

5.2.3 Scientific and Statistical Committee Comments and Recommendations

From their April 2015 meeting

The SSC reviewed and discussed the revised analyses of RA16 alternatives provided by Dr. Nick Farmer. Regarding the three action items listed above the SSC provides the following recommendations:

- *The revised analyses addressed concerns raised by the SSC during the Oct 2014 meeting.*
- *The SSC agrees that this analysis should be considered BSIA.*
- *The SSC agrees that the analysis only characterizes the co-occurrence of whales and black sea bass pots as relative risk, not actual risk or percent risk of entanglement.*

The SEP of the SSC met prior to the full SSC meeting. The SEP made the following recommendations based on specific questions asked regarding the two actions in the amendment:

Action 2

Specific Questions:

1. The Council has request that the SEP look at how **Action 2** is structured. Does the SEP have recommendations regarding this action?

No. The SEP has no recommendation on how Action 2 is structured.

2. Are there additional social or economic analyses that the SEP recommends be completed for this action?

Yes. The SEP recommends that the analysis includes estimates for any potential loss in yield (and associated costs) from the potential gear changes that would result from this action (i.e., loss in CPUE or loss in pots, revenue and/or costs, respectively). Ideally, the gear would be tested for a reduction in breaking strength and diameter with pot weight to minimize potential costs or losses to the fishermen. In addition, the data sources for the costs used should be referenced (we understand that point estimates are sufficient since fishermen will likely use the least expensive alternative, but including those sites would be helpful).

3. What additional recommendations does the SEP have for **Action 2**?

To the extent possible consider the opportunity costs of re-rigging the gear, especially if there is a specified time period, and input from fishermen on how this would affect them.

4. Does this analysis represent BSIA?

No. The SEP feels that this will be the BSIA after the addition of information on the potential cost of lost pots due to the gear requirements.

Note: information on the potential cost of lost pots due to modified gear requirements has been included in the economic effects discussion for **Action 2** (**Section 4.2.2**).

5.2.4 Public Comments and Recommendations

Public comments for Snapper Grouper Regulatory Amendment 16 were taken in August of 2015. In person public hearings were held at three locations: Little River, South Carolina on August 11, 2015; Jacksonville, North Carolina on August 12, 2015; and Ormond Beach, Florida on August 17, 2015. Written public comments were accepted by U.S. mail, facsimile, or email until August 21, 2015.

A total of 11 comments were received. There were seven comments given at the public hearings and four comments were submitted by email.

All of the commenters who appeared in person urged the Council to make provisions to allow black sea bass pot gear in some format from November through April each year. Commenters acknowledged keeping pot gear away from whales was a good idea, not just for the whales, but for fishermen, too.

Highlights of public hearing comments relevant to **Action 2**:

- Fishermen are willing to modify their gear and fishing behavior as necessary so they can fish during the currently closed season and at reasonable depths.

Four written comments were received (including one from a person who also spoke at one of the public hearings). Below is a summary of those written comments.

- The potential hazard to NARWs has been greatly reduced since the requirement of pot endorsements was introduced. Participation in the fishery was capped at 32 participants with no more than 35 pots. Most of the fishermen are using fewer than 35 pots now.
- The Southeastern Fisheries Association, East Coast Fisheries Section, for **Action 2** supported the Council's choices of **Preferred Alternative 2**, **Sub-Alternative 2a**, **Preferred Alternative 3**, and **Preferred Alternative 4**.

Additional public comment outreach was conducted to solicit input from each of black sea bass pot endorsement holders in August and September 2015. The outcome of those interviews is located in **Appendix L**.

5.2.5 Council Choice for Preferred Alternative

The Council chose **Preferred Alternative 4** as its preferred alternative. The Council determined that **Alternative 1 (No Action)** would not be the best alternative because the status quo would not be able to identify black sea bass pot gear if it was found entangled on a NARW.

At the March 2015 Council meeting, **Alternative 9**, **Sub-alternative 9a** was selected as the preferred alternative for **Action 1**. At the June 2015 meeting, the Council changed its preferred alternative and sub-alternative to **Alternative 8**, **Sub-alternative 8a** and at the same meeting selected **Action 2**, **Alternative 2**, **Sub-alternative 2a**, **Alternative 3**, and **Alternative 4** as

preferred alternatives. **Alternative 2**, **Sub-alternative 2a** and **Alternative 3** were selected because pot fishing would have allowed closer to shore under **Action 1**, **Alternative 8**, **Sub-alternative 8a** and the Council was concerned that if NARWs did encounter pot gear, the then-preferred **Alternatives 2**, **Sub-alternative 2a** and **3** would increase the likelihood a NARW could free itself from the gear because of the weaker buoy line and weak links. The Council determined that **Alternatives 2** and **3** would not be good management strategies based on **Action 1**, **Preferred Alternative 11** because black sea bass pots would be required to fish further offshore from November 1 through April 30 when the weather is likely to be rougher than at other times of the year, requiring stronger buoy lines and weak links. The Council's final choice of **Preferred Alternative 11** under **Action 1** requires fishing further offshore than 96% - 97% of all known NARW sightings. Therefore, the Council determined there was little need to require weaker weak links or weaker buoy line strength. Additionally, fishing further offshore as required by **Action 1, Preferred Alternative 11** would necessitate the use of gear with stronger weak links and buoy line strength than specified in **Alternatives 2** and **3**, to help prevent lost pot gear from fishing in deeper depths and stronger currents.

The Council determined **Preferred Alternative 4** of additional gear marking is the best management strategy based on the increased probability of identify black sea bass pot gear if it was found entangled on a NARW.

The Council concluded **Preferred Alternative 4** best meets the purpose and need and the objectives of the Snapper Grouper FMP, as amended, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

Chapter 6. Cumulative Effects

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

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

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:

I. The direct and indirect effects of the proposed actions **(Chapter 4)**;
II. Which resources, ecosystems, and human communities are affected **(Chapter 3)**; and
III. Which effects are important from a cumulative effects perspective **(information revealed in this 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. This section discusses the geographical boundaries of the cumulative effects analysis. For the Regulatory Amendment 16 CEA analysis, we define the extent of the geographical boundaries by the distance of fish migration of snapper-groupers or their larval transport, whichever is greater. 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 1983 through the present. Fishery managers implemented the first significant regulations pertaining to black sea bass in 1983 through the Snapper Grouper FMP (SAFMC 1983). The regulations included an 8 inch minimum size limit for black sea bass.

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 D** 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 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 annual catch limits (ACLs) and accountability measures (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 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 fishery management plans (Snapper Grouper, Dolphin Wahoo, Golden Crab, and *Sargassum*). Actions contained within the Comprehensive ACL Amendment included: (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 2012) contained 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 amendment was partially approved and the final rule published in the *Federal Register* on June 1, 2012, and became effective on July 1, 2012.

Regulatory Amendment 19 (SAFMC 2013b) adjusted the black sea bass harvest limits based on the results of a 2013 update assessment. Because the increase to the acceptable biological catch/ACL was substantial, there was concern that this could extend fishing with pots into the calving season for right whales and create a risk of entanglement for large migratory whales during the fall months. To minimize this risk, the amendment also proposed a closure to black sea bass pot gear from November 1 to April 30. The South Atlantic Fishery Management Council (Council) approved the amendment for submission to the Secretary of Commerce at a special Council meeting held via webinar in May 2013. The final rule published on September 23, 2013. The ACL increase for black sea bass in the South Atlantic was effective September 23, 2013. The annual prohibition on the use of black sea bass pots from November 1 through April 30 became effective October 23, 2013.

Through Regulatory Amendment 14 (SAFMC 2014), the Council modified the fishing year for greater amberjack; revised the minimum size limit measurement for gray triggerfish; increased the minimum size limit for hogfish; modified the commercial and recreational fishing year for black sea bass; adjusted the commercial fishing season for vermilion snapper; modified the aggregate grouper bag limit; and revised the AMs for gag and vermilion snapper. The National Marine Fisheries Service (NMFS) implemented the regulations on December 8, 2014.

B. Present

On January 26, 2016, NMFS issued a final rule that created an expansion of the critical habitat area. The South Atlantic Council voted in December 2015 to send this amendment in for

U.S. Secretary of Commerce review prior to the publication of the final rule for the North Atlantic right whale critical habitat area expansion. The rule would expand the critical habitat to roughly 29,945 square nautical miles, and include northeast feeding areas in the Gulf of Maine/Georges Bank region and calving grounds from southern North Carolina to northern Florida.

The following is language describing the North Atlantic right whale critical habitat area from 50 CFR § 226.203(c) as designated on January 26, 2016:

> *Southeastern United States: Includes marine waters from Cape Fear, North Carolina, southward to 28°N latitude (approximately 31 miles south of Cape Canaveral, Florida) within the area bounded on the west by the shoreline and the 72 COLREGS lines, and on the east by rhumb lines connecting the following points in the order stated from north to south.*

N. Latitude	**W. Longitude**
33°51’ N	at shoreline
33°42’ N	77°43’ W
33°37’ N	77°47’ W
33°28’ N	78°33’ W
32°59’ N	78°50’ W
32°17’ N	79°53’ W
31°31’ N	80°33’ W
30°43’ N	80°49’ W
30°30’ N	81°01’ W
29°45’ N	81°01’ W
29°15’ N	80º55’ W
29°08’ N	80°51’ W
28°50’ N	80°39’ W
28°38’ N	80°30’ W
28°28’ N	80°26’ W
28°24’ N	80°27’ W
28°21’ N	80°31’ W
28°16’ N	80°31’ W
28°11’ N	80°33’ W
28°00’ N	80º29’ W
28°00’ N	At shoreline

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 was developed to improve the timeliness and accuracy of fisheries data reported by permitted dealers. The amendment created 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 proposed rule published in the *Federal Register* on January 2, 2014, the final rule published on April 9, 2014, and became effective on August 7, 2014.

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 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.

C. Reasonably Foreseeable Future

The Joint Commercial Logbook Reporting Amendment would require electronic reporting of landings information by federally-permitted commercial vessels, which is expected to 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 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 O** describes the results of the scoping process.

The Council is considering the implementation of Spawning Special Management Zones through Amendment 36 to the Snapper Grouper FMP. The timeline is for the Council to take final action at the March 2016 meeting.

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 regulations were implemented July 1, 2015.

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. Regulations in Regulatory Amendment 21 became effective on November 26, 2014. 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. Regulations in Amendment 32 became effective on March 30, 2015. In response to stock assessments for snowy grouper and wreckfish, the Council developed Regulatory Amendment 20 to the Snapper Grouper FMP, which became effective on August 20, 2015. At their December 2015 meeting, the Council approved Regulatory Amendment 25, which includes management measures for blueline tilefish and yellowtail snapper. The Council is developing Amendment 37 to the Snapper Grouper FMP, which includes measures for hogfish in response to a stock assessment, and Amendment 41 to the snapper grouper, which includes measures for mutton snapper in response to a stock assessment.

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.

Climate change projections show increases in sea-surface temperature and sea level; decreases in sea-ice cover; and changes in salinity, wave climate, and ocean circulation [Intergovernmental Panel on Climate Change (IPCC) http://www.ipcc.ch/]. These changes are likely to affect plankton biomass and fish larvae abundance that could adversely impact fish, marine mammals, seabirds, and ocean biodiversity. Kennedy et al. (2002) and Osgood (2008) have suggested global climate change could affect temperature changes in coastal and marine ecosystems that can influence organism metabolism and alter ecological processes such as productivity and species interactions; change precipitation patterns and cause 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 influence the productivity of critical coastal ecosystems such as wetlands, estuaries, and coral reefs. NOAA's Climate Change Web Portal (http://www.esrl.noaa.gov/psd/ipcc/ocn/) indicates the average sea surface temperature in the South Atlantic will increase compared to the average over past years. For reef fishes, Burton (2008) speculated climate change could cause shifts in spawning seasons, changes in migration patterns, and changes to basic life history parameters such as growth rates. It is unclear if black sea bass distribution in the South Atlantic has been effected. Black sea bass has been used in the OceanAdapt model (http://oceanadapt.rutgers.edu/regional_data/); this model investigates whether there are distributional trends both in latitude and depth over the time period 1985-2013 for fish species. For black sea bass, there does not appear to be a clear distributional trend in the South Atlantic. These changes in distributions have been hypothesized as a response to environmental factors such as increases in temperature.

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, right whales, and other protected resources 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.

The threats to large endangered whales and the relation to regulatory thresholds, within the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA), can be found in **Sections 3.2** and **4.1** and **Appendix M** of this document.

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 accountability measures (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.

Protected resources

The threats to large endangered whales and the relation to regulatory thresholds, within the ESA and MMPA, can be found in **Sections 3.2.3** and **4.1** and **Appendix M** of this document.

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. The baseline condition for the resources, ecosystems, and human communities can be found in **Chapter 3.**

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 for black sea bass is shown in **Table 6.1**. The analysis that evaluates the potential cause-and-effect relationships between the various alternatives and right whale risk can be found in **Appendix N**.

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
January 1992	Prohibited gear: fish pots 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.
February 24, 1999	Snapper Grouper Amendment 6; SAFMC 1993.	All S-G without a bag limit: aggregate recreational bag limit 20 fish/person/day, excluding tomtate and blue runners. Vessels with longline gear aboard may only possess snowy, warsaw, yellowedge, and misty grouper, and golden, blueline and sand tilefish.
Effective October 23, 2006	Stock assessments indicate **black sea bass**, vermilion snapper, red porgy, and snowy grouper are undergoing overfishing. Snapper Grouper FMP Amendment 13C (SAFMC 2006)	Management measures implemented to end overfishing of these species.
Effective 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 Date July 29, 2009	Stock assessment indicates some species are experiencing overfishing	Protect spawning aggregations and snapper grouper in spawning condition

Time period/dates	Cause	Observed and/or Expected Effects
	and is approaching an overfished condition. Snapper Grouper FMP Amendment 16 (SAFMC 2009a).	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 January 31, 2011	Reauthorized Magnuson-Stevens Act required ACLs and AMs for managed species except those with annual life cycle. Snapper Grouper FMP Amendment 17B (SAFMC 2010b),	Established ACLs and AMs for black sea bass and other snapper grouper species that were undergoing overfishing at the time.
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. Snapper Grouper FMP Regulatory Amendment 9 (SAFMC 2011a)	Harvest management measures for **black sea bass**; commercial trip limits for gag, vermilion snapper, and greater amberjack
Effective Date July 1, 2012	Need to slow rate of harvest in black sea bass pot sector to ease derby conditions. Snapper Grouper FMP Amendment 18A (SAFMC 2012).	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 for-hire sectors
Effective Date January 7, 2013	Clarification of action in Amendment 18A for black sea bass pot endorsement transferability was needed. Snapper Grouper FMP Amendment 18A Transferability Amendment.	Reconsidered action to allow for transfer of **black sea bass** pot endorsements that was disapproved in Amendment 18A.
Effective Date July 17, 2013	The recreational data collection system has changed from MRFSS to MRIP. ACLs and allocations in place utilize MRFSS data. Snapper Grouper FMP Regulatory Amendment 13. (SAFMC 2013c).	Adjust ACLs and allocations for unassessed snapper grouper species with MRIP recreational estimates
Effective Date September 23, 2013	New stock assessment for black sea bass indicates the stock is rebuilt and catch levels can be increased. Snapper Grouper FMP Regulatory Amendment 19 (SAFMC 2013b).	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 December 8, 2014	Snapper Grouper FMP Regulatory Amendment 14 (SAFMC 2014).	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.
Effective Date August 20, 2015	Snapper Grouper FMP Regulatory Amendment 20A (SAFMC 2012b).	Revises the snowy grouper ACLs, commercial trip limit, and recreational fishing season

Time period/dates	Cause	Observed and/or Expected Effects
Target 2016	Snapper Grouper FMP Regulatory Amendment 25.	Proposes to increase the recreational bag limit for **black sea bass**
Target 2017	Snapper Grouper FMP 41 Amendment 41.	Adjust management measures for mutton snapper

9. Determine the magnitude and significance of cumulative effects.

Regulatory Amendment 16 alone would not result in significant cumulative impacts on snapper grouper fishery. When combined with the impacts of past, present, and future actions affecting the snapper grouper fishery, specifically black sea bass, minor cumulative adverse impacts are likely to accrue, such as a shift to fishing with pot gear. Actions in Regulatory Amendment 16 that address the black sea bass segment of the snapper grouper fishery, together or separately, are not expected to result in significant cumulative adverse biological effects. All of the proposed, or recently implemented management actions affecting black sea bass within the snapper grouper fishery, are intended to improve management of the snapper grouper resource, while minimizing, to the maximum extent practicable adverse social and economic impacts. The actions in Regulatory Amendment 16 are expected to reduce the adverse socioeconomic impacts resulting from the annual November 1 through April 30 prohibition on the use of black sea bass pot gear and increase the flexibility of black sea bass pot endorsement holders to fish with this gear while continuing to protect ESA-listed whales in the South Atlantic region and reduce the adverse effects on whales if entangled and help identify black sea bass pot lines used in the South Atlantic.

The actions are not likely to result in direct, indirect, or cumulative adverse 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 the resources found within the national marine sanctuaries.

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

The cumulative adverse effects on the biophysical environment are expected to be negligible. Most of the alternatives in **Action 1** were developed as avoidance and minimization strategies to mitigate potential entanglement effects of fishing sea bass pots during winter months. Mitigation is 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 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 Southeast Fisheries Science Center 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

The actions in this amendment would modify the prohibition for harvest of black sea bass with pots in the winter months, and implement additional gear specifications for pots. The overall cumulative social and economic effects would be associated with increased fishing opportunities for pot endorsement holders, potential effects on hook and line fishermen, restrictions already in place due to existing regulations, and broad social benefits of whale protection.

Because of regulatory and economic changes that have affected the snapper grouper fishery, any action that restricts economic opportunity may have detrimental social and/or economic effects. The commercial sector of the snapper grouper fishery has seen significant changes in regulatory actions with limited entry, ACLs and associated AMs, and other restrictive measures.

Specifically, the black sea bass pot sector has experienced several recent regulatory changes in addition to existing requirements that have limited access to the black sea bass resource. The proposed action to modify the closure to allow fishing in areas that would not increase risk of interaction with right whales is expected to benefit the black sea bass pot fishermen to a large extent.

Furthermore, almost all fishermen or businesses with snapper grouper commercial permits also hold at least one (and usually multiple) additional commercial or for-hire permit to maintain the opportunity to participate in other fisheries. Even within the snapper grouper fishery, effort can shift from one species to another due to environmental, economic, or regulatory changes. Overall, changes in management of one species in the snapper grouper fishery can impact effort and harvest of another species (in the snapper grouper fishery or in another fishery) because of multi-fishery participation that is characteristic in the South Atlantic region.

The cumulative social and economic effects of past, present, and future amendments may be described as limiting fishing opportunities in the short-term, with some exceptions of actions that alleviate some negative social and economic impacts. The intent of these amendments is to improve prospects for sustained participation in the respective fisheries over time and the proposed actions in this regulatory amendment are expected to result in some important long-term benefits to the commercial and for-hire fishing fleets, fishing communities and associated businesses, and private recreational anglers. The proposed changes in this regulatory amendment that could affect access to several important species in the South Atlantic region may contribute to changes in the snapper grouper fishery within the context of the current economic and regulatory environment at the local and regional level.

Chapter 7. List of Preparers

Table 7.1.1. List of 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	Special Assistant to the RA
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

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List of Agencies, Organizations, and Persons Consulted

Environmental Protection Agency
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
Atlantic States Marine Fisheries Commission
National Marine Fisheries Service
- Washington Office
- Office of Ecology and Conservation
- Southeast Fisheries Science Center

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