Appendix A. Glossary

Acceptable Biological Catch (ABC): Maximum amount of fish stock than can be harvested without adversely affecting recruitment of other components of the stock. The ABC level is typically higher than the total allowable catch, leaving a buffer between the two.

ALS: Accumulative Landings System. NMFS database which contains commercial landings reported by dealers.

Biomass: Amount or mass of some organism, such as fish.

B_{MSY}: Biomass of population achieved in long-term by fishing at F_{MSY}.

Bycatch: Fish harvested in a fishery, but not sold or kept for personal use. Bycatch includes economic discards and regulatory discards, but not fish released alive under a recreational catch and release fishery management program.

Caribbean Fishery Management Council (CFMC): One of eight regional councils mandated in the Magnuson-Stevens Fishery Conservation and Management Act to develop management plans for fisheries in federal waters. The CFMC develops fishery management plans for fisheries off the coast of the U.S. Virgin Islands and the Commonwealth of Puerto Rico.

Catch Per Unit Effort (CPUE): The amount of fish captured with an amount of effort. CPUE can be expressed as weight of fish captured per fishing trip, per hour spent at sea, or through other standardized measures.

Charter Boat: A fishing boat available for hire by recreational anglers, normally by a group of anglers for a short time period.

Cohort: Fish born in a given year. (See year class.)

Control Date: Date established for defining the pool of potential participants in a given management program. Control dates can establish a range of years during which a potential participant must have been active in a fishery to qualify for a quota share.

Constant Catch Rebuilding Strategy: A rebuilding strategy where the allowable biological catch of an overfished species is held constant until stock biomass reaches B_{MSY} at the end of the rebuilding period.

Constant F Rebuilding Strategy: A rebuilding strategy where the fishing mortality of an overfished species is held constant until stock biomass reached BMSY at the end of the rebuilding period.

Directed Fishery: Fishing directed at a certain species or species group.

Discards: Fish captured, but released at sea.

Discard Mortality Rate: The percent of total fish discarded that do not survive being captured and released at sea.

Derby: Fishery in which the TAC is fixed and participants in the fishery do not have individual quotas. The fishery is closed once the TAC is reached, and participants attempt to maximize their harvests as quickly as possible. Derby fisheries can result in capital stuffing and a race for fish.

Effort: The amount of time and fishing power (i.e., gear size, boat size, horsepower) used to harvest fish.

Exclusive Economic Zone (EEZ): Zone extending from the shoreline out to 200 nautical miles in which the country owning the shoreline has the exclusive right to conduct certain activities such as fishing. In the United States, the EEZ is split into state waters (typically from the shoreline out to 3 nautical miles) and federal waters (typically from 3 to 200 nautical miles).

Exploitation Rate: Amount of fish harvested from a stock relative to the size of the stock, often expressed as a percentage.

F: Fishing mortality.

Fecundity: A measurement of the egg-producing ability of fish at certain sizes and ages.

Fishery Dependent Data: Fishery data collected and reported by fishermen and dealers.

Fishery Independent Data: Fishery data collected and reported by scientists who catch the fish themselves.

Fishery Management Plan: Management plan for fisheries operating in the federal produced by regional fishery management councils and submitted to the Secretary of Commerce for approval.

Fishing Effort: Usually refers to the amount of fishing. May refer to the number of fishing vessels, amount of fishing gear (nets, traps, hooks), or total amount of time vessels and gear are actively engaged in fishing.

Fishing Mortality: A measurement of the rate at which fish are removed from a population by fishing. Fishing mortality can be reported as either annual or instantaneous. Annual mortality is the percentage of fish dying in one year. Instantaneous is that percentage of fish dying at any one time.

Fishing Power: Measure of the relative ability of a fishing vessel, its gear, and its crew to catch fishes, in reference to some standard vessel, given both vessels are under identical conditions.

$F_{30\%SPR}$: Fishing mortality that will produce a static SPR = 30%.

$F_{45\%SPR}$: Fishing mortality that will produce a static SPR = 45%.

F_{OY}: Fishing mortality that will produce OY under equilibrium conditions and a corresponding biomass of B_{OY}. Usually expressed as the yield at 85% of F_{MSY}, yield at 75% of F_{MSY}, or yield at 65% of F_{MSY}.

F_{MSY}: Fishing mortality that if applied constantly, would achieve MSY under equilibrium conditions and a corresponding biomass of B_{MSY}

Fork Length (FL): The length of a fish as measured from the tip of its snout to the fork in its tail.

Gear restrictions: Limits placed on the type, amount, number, or techniques allowed for a given type of fishing gear.

Growth Overfishing: When fishing pressure on small fish prevents the fishery from producing the maximum poundage. Condition in which the total weight of the harvest from a fishery is improved when fishing effort is reduced, due to an increase in the average weight of fishes.

Gulf of Mexico Fishery Management Council (GMFMC): One of eight regional councils mandated in the Magnuson-Stevens Fishery Conservation and Management Act to develop management plans for fisheries in federal waters. The GMFMC develops fishery management plans for fisheries off the coast of Texas, Louisiana, Mississippi, Alabama, and the west coast of Florida.

Head Boat: A fishing boat that charges individual fees per recreational angler onboard.

Highgrading: Form of selective sorting of fishes in which higher value, more marketable fishes are retained, and less marketable fishes, which could legally be retained are discarded.

Individual Fishing Quota (IFQ): Fishery management tool that allocates a certain portion of the TAC to individual vessels, fishermen, or other eligible recipients.

Longline: Fishing method using a horizontal mainline to which weights and baited hooks are attached at regular intervals. Gear is either fished on the bottom or in the water column.

Magnuson-Stevens Fishery Conservation and Management Act: Federal legislation responsible for establishing the fishery management councils and the mandatory and discretionary guidelines for federal fishery management plans.

Marine Recreational Fisheries Statistics Survey (MRFSS): Survey operated by NMFS in cooperation with states that collects marine recreational data.

Maximum Fishing Mortality Threshold (MFMT): The rate of fishing mortality above which a stock's capacity to produce MSY would be jeopardized.

Maximum Sustainable Yield (MSY): The largest long-term average catch that can be taken continuously (sustained) from a stock or stock complex under average environmental conditions.

Minimum Stock Size Threshold (MSST): The biomass level below which a stock would be considered overfished.

Modified F Rebuilding Strategy: A rebuilding strategy where fishing mortality is changed as stock biomass increases during the rebuilding period.

Multispecies fishery: Fishery in which more than one species is caught at the same time and location with a particular gear type.

National Marine Fisheries Service (NMFS): Federal agency within NOAA responsible for overseeing fisheries science and regulation.

National Oceanic and Atmospheric Administration: Agency within the Department of Commerce responsible for ocean and coastal management.

Natural Mortality (M): A measurement of the rate at which fish are removed from a population by natural causes. Natural mortality can be reported as either annual or instantaneous. Annual mortality is the percentage of fish dying in one year. Instantaneous is that percentage of fish dying at any one time.

Optimum Yield (OY): The amount of catch that will provide the greatest overall benefit to the nation, particularly with respect to food production and recreational opportunities and taking into account the protection of marine ecosystems.

Overfished: A stock or stock complex is considered overfished when stock biomass falls below the minimum stock size threshold (MSST) (e.g., current biomass < MSST = overfished).

Overfishing: Overfishing occurs when a stock or stock complex is subjected to a rate of fishing mortality that exceeds the maximum fishing mortality threshold (e.g., current fishing mortality rate > MFMT = overfishing).

Quota: Percent or annual amount of fish that can be harvested.

Recruitment (R): Number or percentage of fish that survives from hatching to a specific size or age.

Recruitment Overfishing: The rate of fishing above which the recruitment to the exploitable stock becomes significantly reduced. This is characterized by a greatly reduced spawning stock, a decreasing proportion of older fish in the catch, and generally very low recruitment year after year.

Scientific and Statistical Committee (SSC): Fishery management advisory body composed of federal, state, and academic scientists, which provides scientific advise to a fishery management council.

Selectivity: The ability of a type of gear to catch a certain size or species of fish.

South Atlantic Fisheries Management Council (SAFMC): One of eight regional councils mandated in the Magnuson-Stevens Fishery Conservation and Management Act to develop management plans for fisheries in federal waters. The SAFMC develops fishery management plans for fisheries off North Carolina, South Carolina, Georgia, and the east coast of Florida.

Spawning Potential Ratio (Transitional SPR): Formerly used in overfished definition. The number of eggs that could be produced by an average recruit in a fished stock divided by the number of eggs that could be produced by an average recruit in an unfished stock. SPR can also be expressed as the spawning stock biomass per recruit (SSBR) of a fished stock divided by the SSBR of the stock before it was fished.

% Spawning Per Recruit (Static SPR): Formerly used in overfishing determination. The maximum spawning per recruit produced in a fished stock divided by the maximum spawning per recruit, which occurs under the conditions of no fishing. Commonly abbreviated as %SPR.

Spawning Stock Biomass (SSB): The total weight of those fish in a stock which are old enough to spawn.

Spawning Stock Biomass Per Recruit (SSBR): The spawning stock biomass divided by the number of recruits to the stock or how much spawning biomass an average recruit would be expected to produce.

Total Allowable Catch (TAC): The total amount of fish to be taken annually from a stock or stock complex. This may be a portion of the Allowable Biological Catch (ABC) that takes into consideration factors such as bycatch.

Total Length (TL): The length of a fish as measured from the tip of the snout to the tip of the tail.

Regulatory Amendment 11:
Warsaw Grouper and Speckled Hind Catches in the U.S. South Atlantic
NOAA Fisheries Service
Southeast Regional Office
June 1, 2011 (revised August 23, 2011)

INTRODUCTION

In 1994, the sale of speckled hind (*Epinephelus drummondhayi*) and warsaw grouper (*E. nigritus*) was prohibited in the South Atlantic EEZ. Due to continuing concerns regarding the overfished status of these stocks, Amendment 17B to the South Atlantic Fishery Management Council's Snapper-Grouper Fishery Management Plan (S-G FMP) established annual catch limits (ACLs) of 0 pounds for speckled hind and warsaw grouper in January 2011. Due to concerns about bycatch of these species, Amendment 17B also prohibited harvest beyond a depth of 240 ft for snowy grouper, blueline tilefish, yellowedge grouper, misty grouper, queen snapper, and silk snapper in the U.S. South Atlantic. Regulatory Amendment 11 (Reg-11) to the S-G FMP proposes adjustments to the regulations imposed by Amendment 17B to alleviate social and economic impacts while maintaining protections for speckled hind and warsaw grouper. For example, some alternatives in Reg-11 consider modifying the closure to allow harvest of blueline tilefish or snowy grouper north of Cape Hatteras, NC, or south of Cape Canaveral, Florida. This analysis seeks to identify: (1) What data are available for speckled hind and warsaw grouper, (2) Where speckled hind and warsaw grouper are caught, and (3) What species are caught with speckled hind and warsaw grouper.

METHODS

Data Sources
Data from the Southeast Fisheries Science Center's (SEFSC) commercial logbook program, SEFSC's supplemental discard commercial logbook program, SEFSC's headboat survey (HBS), reef fish observer program (RFOP), Marine Resources Monitoring Assessment and Prediction (MARMAP) program, accumulated landings system (ALS), and Florida, Georgia, South Carolina, and North Carolina trip tickets (TT) were evaluated to determine locations of warsaw grouper and speckled hind encounters and co-occurrence with other species. Locations of catch were provided to the highest possible resolution.

The SEFSC's commercial logbook program (accessed 9 Mar 2011) consisted of self-reported landings on a trip level from commercial fishermen. This dataset provided species-specific landings (in lbs), primary gear used, primary area and depth of capture. The SEFSC's supplemental discard commercial logbook program began in 2001 and came from a random sample of 20% of commercial vessels. Commercial logbook and supplemental discard logbook data were merged into a combined CLB dataset for the years 2001-2009. All trip records with a recorded landing or discard of warsaw grouper or speckled hind were retained. Area fished was based on reported 1° longitude by 1° latitude commercial logbook statistical areas. A single depth of fishing was reported in the commercial logbooks for each species per trip from 2005 onward, although they may be encountered at numerous depths during multiple sets. Very little

depth of capture information was available prior to 2005, and no harvest information was available prior to the harvest prohibition in 1994.

In July 2006, NOAA Fisheries Service began a voluntary reef fish observer program (RFOP) to characterize fishery landings and bycatch in the southern U.S. Atlantic Ocean. This voluntary program suffers from spatial and sampling biases; however, it does provide accurate species identification and depth of capture at the gear set-level for species encountered using bottom longline, electric (bandit) reel, and hand lines. Depth fished was reported for each set.

The recreational headboat sector of the snapper-grouper fishery was evaluated using HBS logbook data (accessed 2 Feb 2011) reported by headboat operators. Headboats are large, for-hire vessels that typically accommodate 20 or more anglers on half- or full-day trips. HBS records are arranged similar to commercial logbook records, and contain trip-level information on number of anglers, trip duration, date, area fished, landings (number of fish), and releases (number of fish) of each species. Headboat encounters (landings plus releases) were summarized by species, year, month, and area fished for the years 1973-2009. Reporting of area fished has improved through time, with resolution ranging from state level to 0.17° by 0.17° grids. For cluster analysis, area fished was aggregated at the most common reporting level (1° latitude by 1° longitude). As with the commercial fishery data, area fished is self-reported and this could have introduced error into the analysis. Additionally, vessels fishing in multiple areas during a trip would be constrained by the current data form to select one area fished for the trip, which limits the spatial precision of the analysis. Depth fished was not reported.

For over thirty years, the Marine Resources Research Institute at the South Carolina Department of Natural Resources, through the MARMAP program, has conducted fisheries-independent research within the region between Cape Lookout, North Carolina, and Ft. Pierce, Florida. The overall mission of the program is to determine distribution, relative abundance, and critical habitat of economically and ecologically important fishes of the southeastern U.S., and to relate these features to environmental factors and exploitation activities. MARMAP survey work has provided a monitoring program that allowed standardized sampling of fish populations over time and development of a historical base for future comparisons of long-term trends. The gears (e.g., chevron trap, bottom longlines) and methodologies used have been consistent over the years to allow for long term analysis and comparisons. Historically, sampling effort for snapper-grouper has been concentrated off South Carolina using various trap gears. MARMAP samples accurately identify fish to species and also collect valuable information on undersized fish. MARMAP data for the years 1977-2009 were aggregated by individual gear (i.e., a single trap, or a single line), at the set level. Depth fished was reported for each set.

Information on the quantity and value of seafood products caught by fishermen and sold to established seafood dealers or brokers are reported to the fisheries agency in each state. The accumulated landings system (ALS) is a general canvass landings data encompassing all landings statistics for the Southeast Region. The data was filtered so only landings from states in the south Atlantic region remained (Florida, Georgia, South Carolina, and North Carolina), and only landings from the Atlantic side of Florida were included. The database began in 1962 but Florida was the only south Atlantic state that had records during this early period. ALS data was

available in Georgia starting in 1979, South Carolina in 1980, and North Carolina in 1981. Catch location data did not begin until after 1992.

Each state of the south Atlantic region has their own commercial trip ticket database. These databases provide information on catch (i.e. date, pounds and price) of fish species landed. This program began in Florida in 1986, followed by South Carolina in 1989, North Carolina in 1994, and then Georgia in 2004. In later years the states recorded general catch locations in one degree squares. Florida began providing general catch locations in 1992. Georgia recorded general catch locations for only 5% of the landings for all years of available data (2004-2009). South Carolina started reporting general catch locations in 2004, and North Carolina always recorded general locations of the catch since the beginning (1994).

Cluster Analysis

Dimension reduction and hierarchical cluster analyses were used to evaluate associations of speckled hind and warsaw grouper with other species in the catch. These analyses were performed upon fishery datasets containing 'area-fished' information (i.e., CLB, RFOP, HBS, and MARMAP). Each data set was formatted as a matrix, with columns representing species (i) and rows representing aggregation bins (j). Aggregation bins represented the highest resolution of data available for the dataset. Fishermen will typically make multiple sets on a trip, sometimes in geographically distant areas, targeting different species. Aggregating landings at the highest resolution reduced the probability of grouping species caught during the same time period that would likely not co-occur during any given set due to disparate geographic distributions. For CLB, aggregation bins were *year-month-area* combinations. For the RFOP, aggregation bins were *set-level*. For HBS, aggregation bins were *year-month-area (1° latitude by 1° longitude)* combinations. For MARMAP, aggregation bins were *set-level*. Within each element of the matrix (c_{ij}) the presence or absence of a species (i) landed in a specific bin (j), was assigned a '1' when there was an encounter and assigned a '0' when there were no encounters. Whenever possible, discards were included in the aggregated catch, as they provide valuable information when determining species associations.

By restricting the analysis to only bins where speckled hind or warsaw grouper were observed, we ensured that the resultant clusters would be representative of the co-occurrence of other species with these two species of concern. Because the fishing effort that generates the landings data does not represent a consistent sampling program, reported landings data might not be quantitatively comparable between collections. Additionally, due to the restrictions on harvest since 1994, for most of the data sources examined, the catch of warsaw grouper and speckled hind is incidental. Boesch (1977) suggested a binary index (e.g., 'presence-absence') may be a more appropriate measure of similarity for data collected with an inconsistent sampling framework (e.g., fishery-dependent data). A binary index applied to each fish record also reduces distortions caused by using fish weights which are influenced by super-abundant and heavier species.

Dimension reduction was conducted using PROC VARCLUS in SAS V9.2 (SAS Institute Inc., Cary, NC). PROC VARCLUS is a dimension reduction tool that clusters variables with the greatest correlation and minimized correlations with other clusters. The algorithm used by

PROC VARCLUS is binary and divisive - all variables start in one cluster. A cluster is chosen and split into two clusters by performing an orthoblique rotation on the first two principal components. Each variable is assigned to the rotated component with which it has the higher squared correlation. The procedure is nonhierarchical; variables are iteratively reassigned to clusters to maximize the variance accounted for by the cluster components. Clusters are split until all variance is explained (i.e., 'proportion=1').

Hierarchical cluster analysis of species presence-absence data used average linkage between groups with a Sørenson measure of dissimilarity:

$$D_{ih} = \sum_{j=1}^{J} \frac{\left|c'_{ij} - c'_{hj}\right|}{\left|c'_{ij} - c'_{hj}\right|} \tag{1}$$

where D_{ih} is the distance between species i and h, and j is the number of rows (bins). The Sørenson (e.g. 'Dice', 'Bray-Curtis', 'Czekanowski') measure is an index in which joint absences are excluded from consideration, and matches are double weighted. The Sørenson measure has been found to be more robust in ecological studies (Beals 1973, Field et al. 1982, Faith et al. 1987), and is commonly used in studies of fish assemblages (e.g., Mueter & Norcross 2000, Gomes et al. 2001, Williams and Ralston 2002, Shertzer & Williams 2008, Shertzer et al. 2009).

The average linkage clustering function specifies the distance between two clusters as the average distance between objects from the first cluster and objects from the second cluster. Averaging is performed over all pairs (x, y) of objects, where x is an object from the first cluster and y is an object from the second cluster. The average linkage function is expressed as follows:

$$D(X,Y) = \frac{1}{N_X * N_Y} \sum_{i=1}^{N_X} \sum_{j=1}^{N_Y} d(x_i, y_i); \quad x_i \in X, y_i \in Y \tag{2}$$

where $d(x, y)$ is the distance between objects $x \in X$ and $y \in Y$; X and Y are two sets of objects (clusters), and N_X and N_Y are the numbers of objects in clusters X and Y, respectively. Average-link clustering is less sensitive to outliers than complete-link clustering, and less likely to form long chains than single-link clustering. This method is also known as the 'unweighted pair-group method using arithmetic averages' (UPGMA), and is widely used in ecology (see Boesch 1977, McGarigal et al. 2000). This method is a space-conserving strategy that introduces little distortion to the relationships expressed in the similarity matrix (Boesch 1977).

Dendrograms were generated for each cluster, based upon the agglomeration schedule. The dendrogram is read from left to right, with vertical lines indicating joined clusters. The position of the line on the scale indicates the distance at which clusters are joined. In SPSS, observed distances are rescaled to fall into the range of 1 to 25; the ratio of the rescaled distances within the dendrogram is the same as the ratio of the original distances. In SAS, Proc TREE was used to plot the dimension reductions with the proportion of variability explained as the height variable. Species joined closer to the left of the dendrogram would be considered more associated.

RESULTS

Gear

- In all datasets except MARMAP, the primary gears catching warsaw grouper, speckled hind, and blueline tilefish were vertical line and bandit gears, followed by longlines. Traps were the primary gear catching warsaw grouper and speckled hind during MARMAP sampling.

Commercial Logbook and Supplemental Discard Logbook (2001-2009)

- 42 records for warsaw grouper were reported, with most encounters off St. Augustine, FL and South Carolina.
- 255 records for speckled hind were reported, with most encounters off Charleston, SC, Wilmington, N.C. and Cape Hatteras, N.C.

Headboat Logbook (1973-2009)

- 3,203 records for warsaw grouper were reported, with most encounters off Charleston, SC, St. Augustine, FL, and Cape Canaveral, FL (**Figure 1**).
- 26,650 records for speckled hind were reported, with most encounters off Charleston, SC (**Figure 1**).

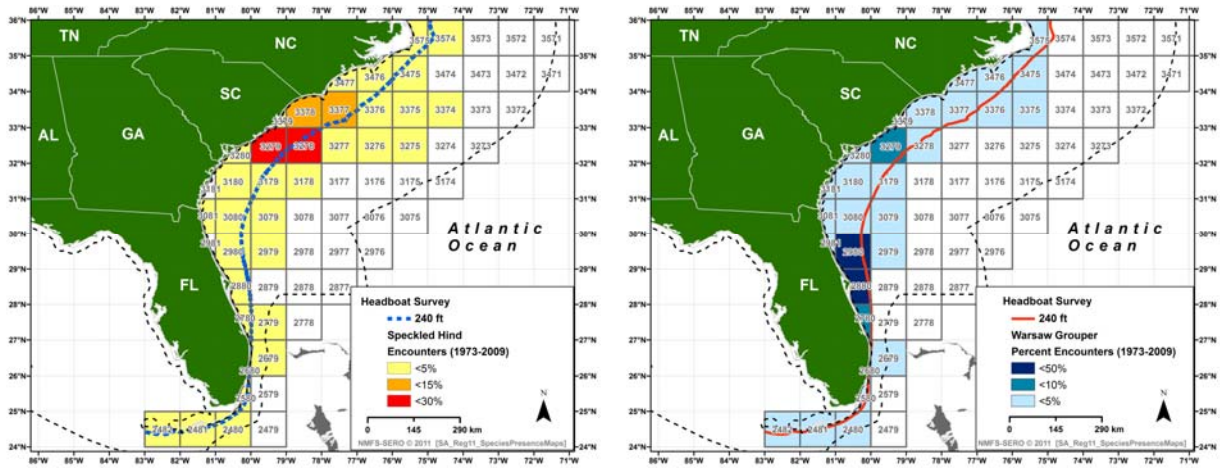

Figure 1.- Headboat survey encounters (1973-2009) of speckled hind (n=26,650) and warsaw grouper (n=3,203).

Reef Fish Observer Program (2006-2009)

- 13 records for warsaw grouper were reported, with encounters off SC and GA (**Figure 2**).
- 318 records for speckled hind were reported, with encounters ranging from NC to mid-FL (**Figure 2**).

MARMAP (1977-2009)

- 9 records for warsaw grouper, with most encounters off SC (**Figure 2**).
- 30 records for speckled hind, with most encounters off SC (**Figure 2**).

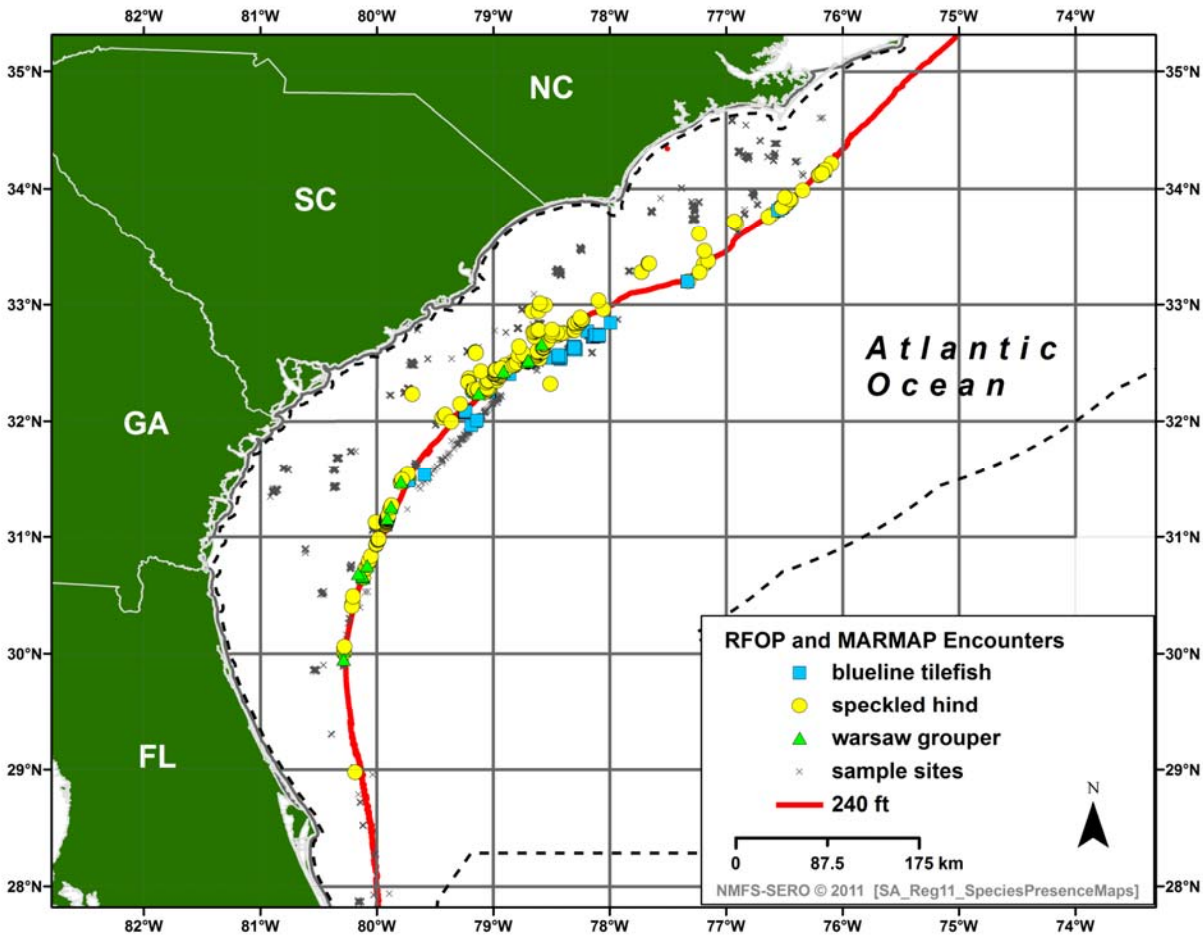

Figure 2.- Reef fish observer program (2006-2009) and MARMAP (1977-2009) encounters of blueline tilefish (n=103), speckled hind (n=348), and warsaw grouper (n=22). 'Sample sites' indicate MARMAP sets using gears that could have caught the species of interest. Data were aggregated and RFOP 'sample sites' are not shown to protect confidentiality.

ALS (1962-2010)

- No specific catch location data were available for either species prior to 1992. Instead, the catch location was listed as southeast US.
- 2,309 records for warsaw grouper were reported. After 1992, the majority of the warsaw grouper catch was reported in the Florida Keys (**Table 1**).
- 2,145 records for speckled hind were reported. After 1992, the majority of the speckled hind catch was reported in the Florida Keys (**Table 1**).

FL Trip Ticket (1986-1992)

- Only general locations of the catch were available before 1992.
- 1,731 records for warsaw grouper. After 1992, the majority of the catches came from offshore waters of Cape Canaveral and Jacksonville (**Table 1**).
- 205 records for speckled hind. After 1992, the majority of catches with recorded locations came from offshore waters of Jacksonville (**Table 1**).

Table 1.- Percentage of catch where specific Florida trip ticket (FTT) location data and accumulated landing system (ALS) data were available. Catch is in pounds gutted weight.

Warsaw				Region			
% of landings	Time Period	Not Recorded	Jacksonville	Canaveral	West Palm	Miami	Keys
ALS	1992-2009	0.0	2.6	7.9	1.9	23.6	**64.1**
FTT	1986-1992	20.1	28.7	**32.1**	8.9	3.2	7.1
Speckled Hind				Region			
% of landings	Time Period	Not Recorded	Jacksonville	Canaveral	West Palm	Miami	Keys
ALS	1992-2009	0.0	3.8	11.9	4.9	7.8	**71.7**
FTT	1986-1992	**79.4**	18.2	0.0	0.5	1.9	0.0

SC Trip Ticket (1989-2009)

- No location data was available for reported catches of warsaw grouper. The majority of speckled hind records (96%) also had no location information. When location information was available, it was not possible to determine the depth of the catch due to the coarse spatial resolution of the reported location.
- For warsaw grouper, there were 48 records from 1989-1992, and 47 records from 1993-1996. There were no warsaw grouper records after 1996. No location data were available for any of these records.
- For speckled hind, there were 213 records from 1989-1992, and 137 records from 1993-2008. The 2004 to 2008 records had location grids off of Myrtle Beach and Charleston. It is not possible to determine the depth where these fish were caught because these two location codes include South Carolina's shoreline.

GA Trip Ticket (2004-2009)

- There were no records reported for warsaw grouper.
- Only one speckled hind record was reported in 2004 with no location data.

NC Trip Ticket (1994-2010)

- Landings locations were separated into state or federal waters and north or south of Cape Hatteras.
- 5 records of warsaw grouper were available from the years 1994, 2001, and 2010. One record was reported in North Carolina state waters (within 3 miles from shore). Another record was reported in federal waters south of Cape Hatteras. The final three records were reported from federal waters (>3 miles from shore, water zone 25) with no detail on whether the fish were caught north or south of Cape Hatteras.
- 38 records of speckled hind were available from the years 1994-1998. The locations of the catches were in three different areas. Two of the records were from federal waters north of Cape Hatteras. Five records were in federal waters south of Cape Hatteras. Thirty-one of the records were in federal waters (>3 miles from shore, water zone 25) with no detail on whether the fish were caught north or south of Cape Hatteras.

- 11,817 blueline tilefish records were available. Most of the records (46%) were in federal waters. These catches were mostly south of Cape Hatteras (45%), followed by north of Cape Hatteras (37%), and the remaining federal waters catches did not have location information (18%) (**Table 2**). There were a small number of blueline tilefish reportedly caught in state waters (<1%, n=89). Given the depth distribution of the species, these observations may have been misreported.

Table 2.- Location of blueline tilefish records.

Water Code	n	Location
20	67	North Carolina state waters north of Cape Hatteras
21	22	North Carolina state waters south of Cape Hatteras
22	4,322	Federal waters north of Cape Hatteras
23	5,385	Federal waters south of Cape Hatteras
24	17	North Carolina state waters
25	2,004	Federal waters, no other location information
Total	11,817	

Depth

- All data sources (i.e., Commercial Logbook, Discard Logbook, Reef Fish Observer Program, and MARMAP) were heavily biased towards fishing inshore of 240 ft depth (**Figure 3**). Coupled with the harvest prohibition and the rarity of speckled hind and warsaw grouper, this implies most speckled hind and warsaw grouper encounters would occur inshore of 240 ft. Chi-square tests and Fisher Exact tests suggested that although most encounters occurred inshore of 240 ft, the odds of encountering speckled hind and warsaw grouper are higher outside of 240 ft.
- The limited depth information available suggested limited encounters of speckled hind and warsaw grouper in waters >240 ft depth North of Cape Hatteras and South of Cape Canaveral. Few encounters were reported in waters >500 ft depth throughout the EEZ (**Table 3**). By contrast, the majority of commercial logbook reported landings of snowy grouper (67% across SAFMC; 76% in waters South of Cape Canaveral) and yellowedge grouper (50% across SAFMC; 77% in waters South of Cape Canaveral) were >500 ft depth.

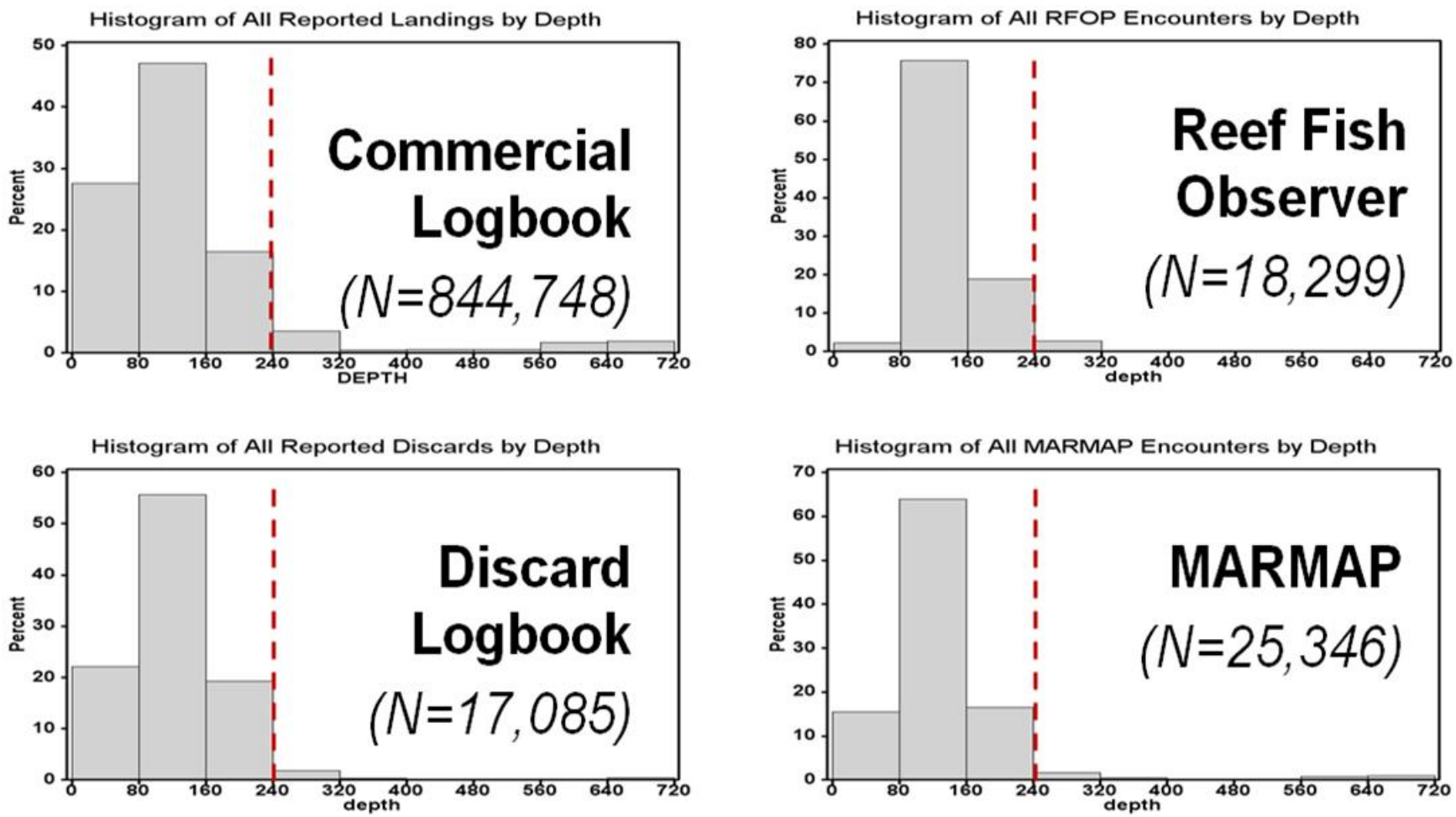

Figure 3. 'Sampling' distributions for all records (all species), by depth, for Commercial Logbook, Discard Logbook, Reef Fish Observer, and MARMAP datasets.

Table 3.- Percent of observations by depth and area.

	Speckled Hind				Warsaw Grouper			
Range	**Comm LB***	**Discard LB**	**RFOP**	**MARMAP**	**Comm LB***	**Discard LB**	**RFOP**	**MARMAP**
>240 ft North of 35°00	4%	0%	0%	0%	0%	0%	0%	0%
>240 ft South of 27°00	2%	0%	0%	0%	0%	0%	0%	0%
>500 ft Entire EEZ	4%	0%	0%	0%	0%	0%	0%	0%

*Ratio of lbs landed.

Encounters South of Cape Canaveral, FL or North of Cape Hatteras, NC

- The limited data available suggested that catches of warsaw grouper and speckled hind do occur south of Cape Canaveral (**Table 4**).
- The limited data available suggested that few catches of warsaw grouper and speckled hind do occur north of Cape Hatteras, NC (**Table 4**).

Table 4. – Percent of warsaw grouper and speckled hind records north of Cape Hatteras, NC or south of Cape Canaveral, FL.

	North of Cape Hatteras		South of Cape Canaveral	
Dataset	**Warsaw Grouper**	**Speckled Hind**	**Warsaw Grouper**	**Speckled Hind**
ALS	0%	0%	4%	12%
Trip Ticket	n/a	1%	24%	1%
Headboat Survey	0%	1%	5%	3%
MARMAP	0%	0%	0%	0%
RFOP	0%	0%	0%	0%
CLB	0%	2%	0%	5%

Species Associations

- In general, speckled hind and warsaw grouper rarely co-occurred with snowy grouper, blueline tilefish, yellowedge grouper, misty grouper, queen snapper, or silk snapper (**Table 5**).
- Hierarchal cluster analyses of commercial logbook data indicated relatively low levels of association between warsaw grouper, speckled hind and other deep-water species (**Figure 4**). Warsaw grouper was most closely associated with shallow-water groupers and speckled hind was most closely associated with vermilion snapper, red porgy, and scamp.
- Dimension reduction analyses of commercial logbook data showed warsaw grouper was closely associated with misty grouper and lightly associated with snowy grouper, but not other deep-water species. Speckled hind was closely associated with red grouper, scamp, and red porgy, but not other deep water species (**Figure 5**).
- Hierarchal cluster analyses of headboat data indicated warsaw grouper most closely associated with shallow-water snappers and speckled hind were most closely associated with porgies and grunts (**Figure 6**).

- Dimension reduction analyses of headboat data showed warsaw grouper and speckled hind were closely associated with each other. These species were also associated with grunts and porgies. Blueline tilefish was most closely associated with snowy grouper and yellowedge grouper (**Figure 7**).
- Dimension reduction analyses of reef fish observer data showed warsaw grouper and speckled hind were closely associated with each other. Blueline tilefish, snowy grouper, and yellowedge grouper were on separate branches of the dendogram and distinctly separated from speckled hind and warsaw grouper (**Figure 8**).

Table 5.- Top co-occurring species with warsaw grouper and speckled hind for the merged commercial logbooks (CLB) and headboat survey (HBS) datasets. Amendment 17B 'deep-water' species are in bold.

	With Speckled Hind		With Warsaw Grouper	
Rank	**Commercial**	**Headboat**	**Commercial**	**Headboat**
1	red porgy	vermilion snapper	red porgy	gray triggerfish
2	scamp	gray triggerfish	scamp	black sea bass
3	vermilion snapper	scamp	vermilion snapper	red snapper
4	greater amberjack	red porgy	greater amberjack	gag
5	red snapper	tomtate	**speckled hind**	gray snapper
6	gag	white grunt	red snapper	lane snapper
7	red grouper	knobbed porgy	gag	vermilion snapper
8	gray triggerfish	greater amberjack	gray triggerfish	tomtate
9	**warsaw grouper**	gag	red grouper	scamp
10	rock sea bass	red snapper	red hind	whitebone porgy
11	**snowy grouper**	black sea bass		greater amberjack
12	yellowtail snapper	whitebone porgy		red porgy
13	black grouper	almaco jack		red grouper
14	blue runner	bank sea bass		white grunt
15	crevalle jack	graysby		almaco jack
16	almaco jack	queen triggerfish		knobbed porgy
⋮	⋮	⋮	⋮	⋮
	blueline tilefish (#22)	***blueline tilefish (#32)***	***no blueline tilefish***	***blueline tilefish (#39)***

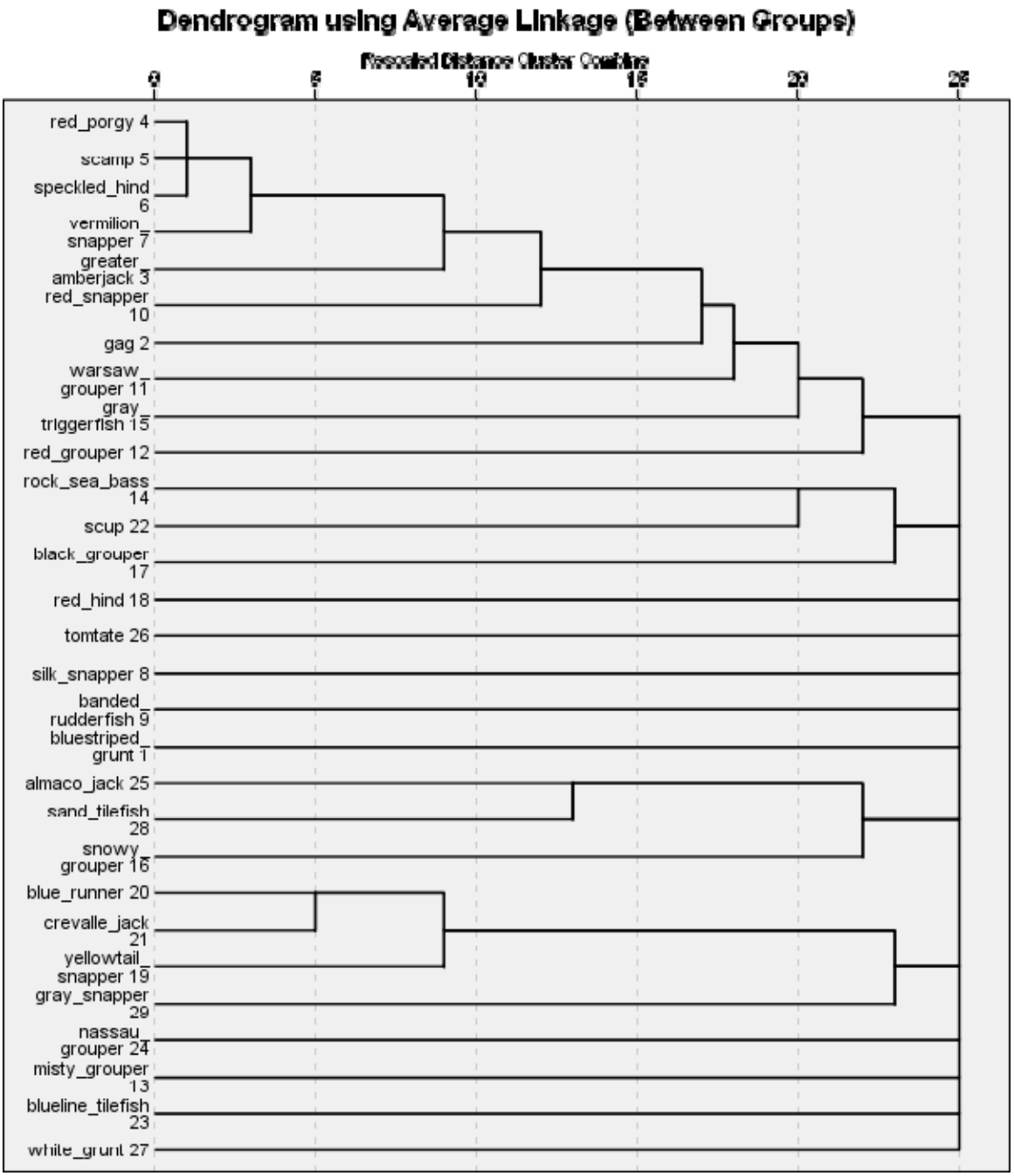

Figure 4.- Hierarchical cluster analyses results for the commercial logbook dataset from 2001 to 2009 (warsaw grouper n=42; speckled hind n=255). Only includes trips where a warsaw grouper or speckled hind was caught. Average linkage method was used with Sorenson similarity measure and binary transformation.

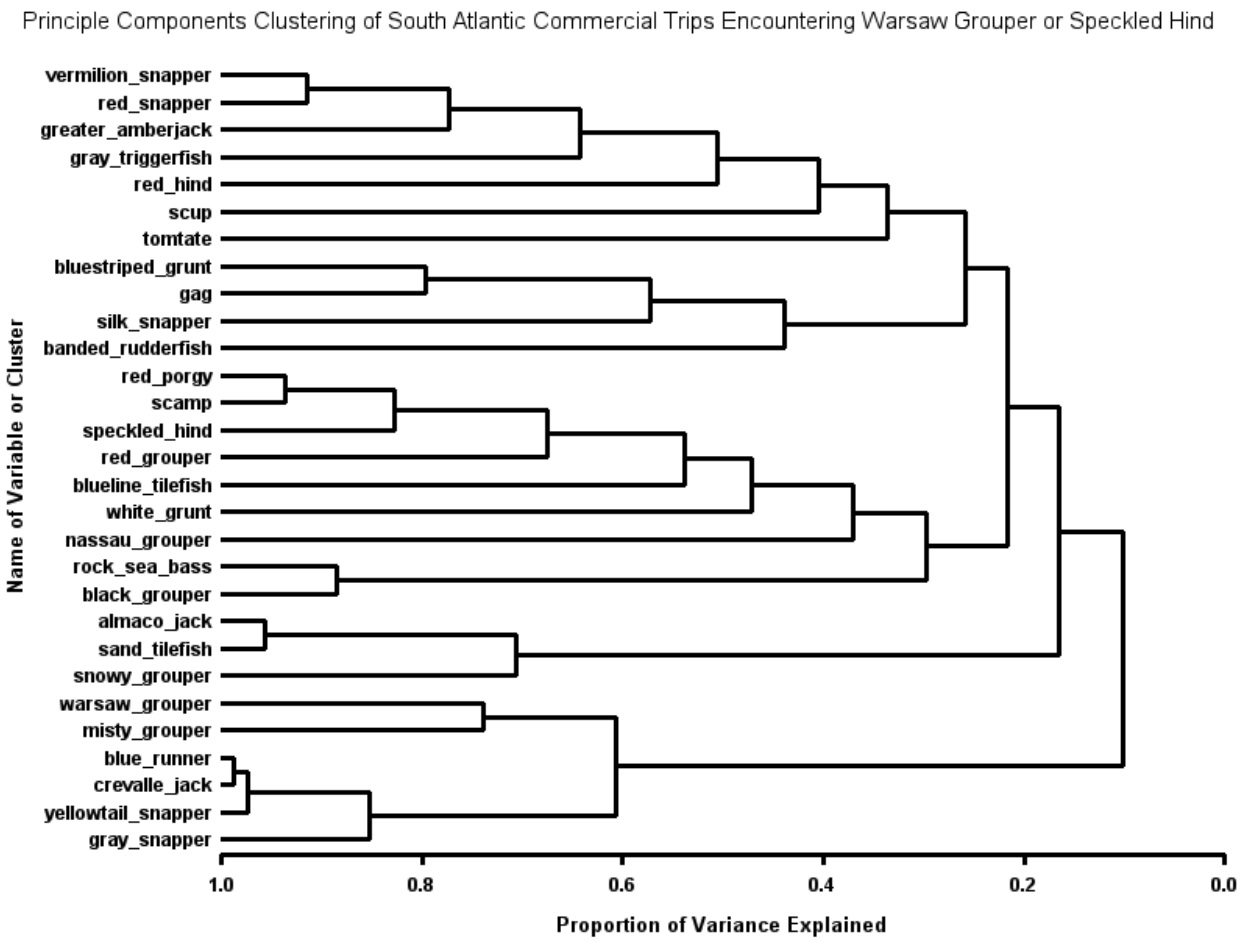

Figure 5.- Dimension reduction analysis results for the commercial logbook dataset from 2001 to 2009 (warsaw grouper n=42; speckled hind n=255).

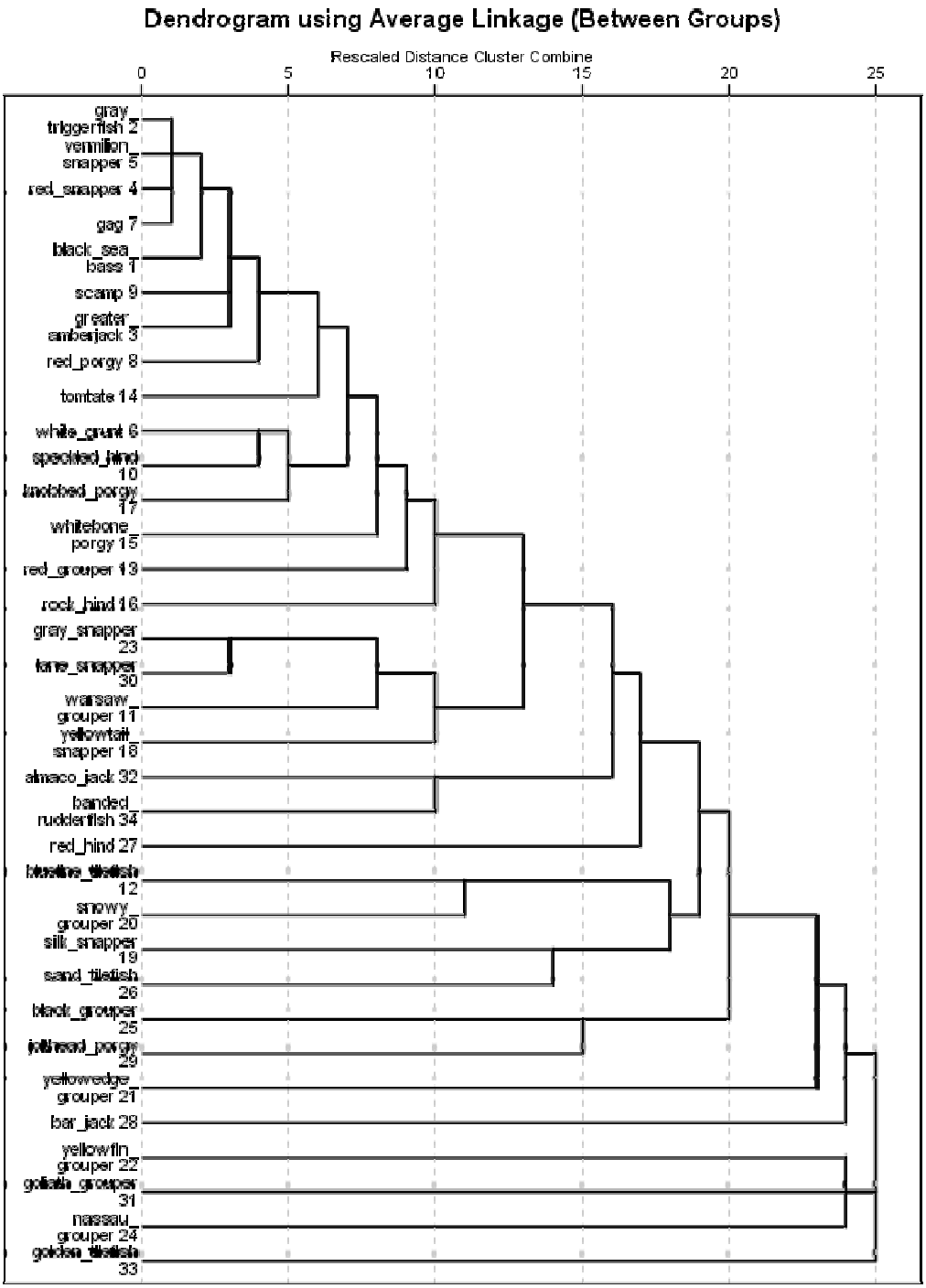

Figure 6.- Hierarchical cluster analyses results for the headboat logbook dataset from 1973 to 2009 (warsaw grouper n=3,203; speckled hind n=26,650). Only includes trips where a warsaw grouper or speckled hind was caught. Average linkage method was used with Sorenson similarity measure and binary transformation.

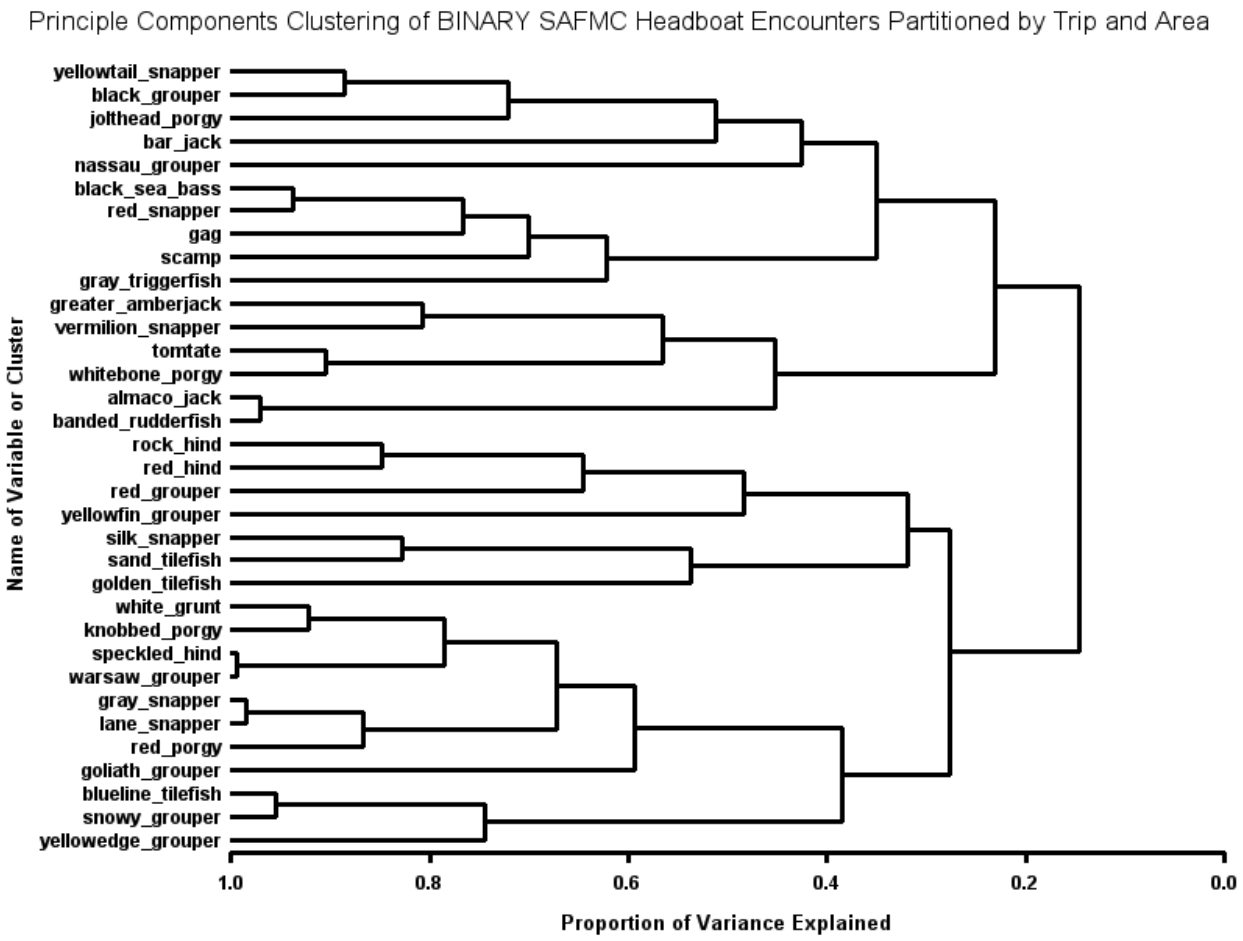

Figure 7.- Dimension reduction analysis results for the headboat logbook dataset from 1973 to 2009 (warsaw grouper n=3,203; speckled hind n=26,650).

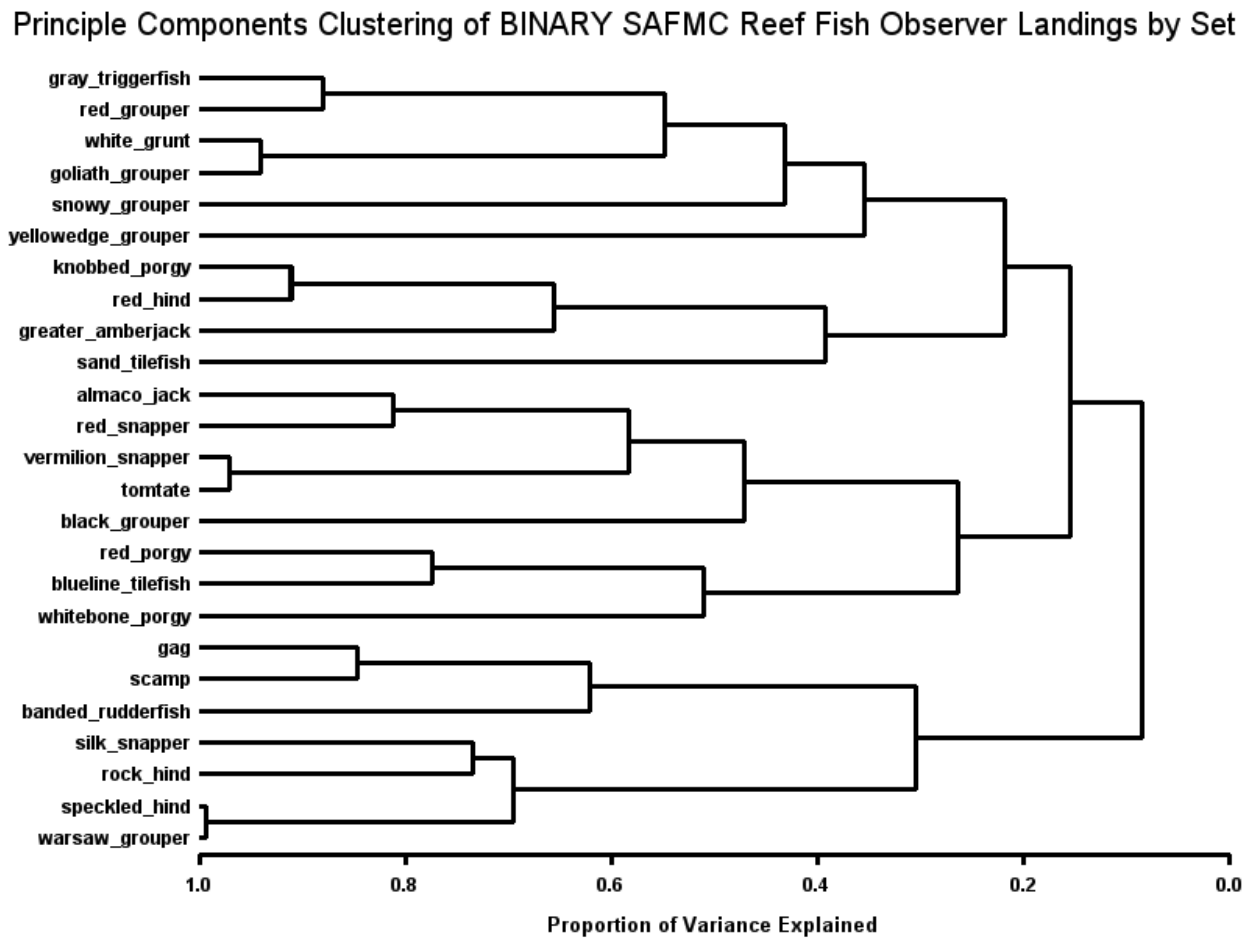

Figure 8.- Dimension reduction analysis results for the reef fish observer dataset from 1973 to 2009 (warsaw grouper n=13; speckled hind n=182).

CONCLUSIONS

- Overall there were a relatively small number of warsaw grouper and speckled hind records. When data were available there was limited information on the catch location. **Table 6** provides a summary of the records for each dataset.
- Very few data were available prior to the 1994 harvest prohibition on speckled hind and warsaw grouper. Of those data that were available, location was seldom available and never highly resolved. Depth was unavailable for most datasets. As such, all conclusions that might be drawn about the distribution of the stock from post-1994 data suffer from biases for under-representation due to the disincentive to retain the fish, and incentives to misidentify the fish if kept and sold.
- For most data sources, depth information was entirely unavailable, rendering it impossible to control for this bias. For data sources with depth, samples were most frequently from depths beyond 160 ft.
- The RFOP and MARMAP datasets indicated catches of warsaw grouper and speckled hind more inshore of the blueline tilefish (**Figure 2**). However, these two datasets have potentially biased results because they had limited sampling beyond 240 feet.

- FL Trip Ticket (1986-1992) and ALS data (1992-2009) indicate substantial landings of warsaw grouper and speckled hind south of Cape Canaveral (**Table 1**).
- Available data suggested encounters with warsaw grouper and speckled hind are uncommon north of Cape Hatteras (**Table 4**). The North Carolina trip ticket and commercial logbook datasets are subject to bias since no commercial sale was allowed for the duration of available data. Additionally, the North Carolina trip ticket data reported a large amount of blueline tilefish records (37%, n= 4,322) north of Cape Hatteras.

Table 6- Summary of warsaw and speckled hind catches for all south Atlantic datasets. Values in parentheses are sample size.

Data	Years	Location of Majority of Catch (# Records)		Discard Info	Depth Info
		Warsaw Grouper	Speckled Hind		
Commercial Logbooks	2001-2009	St. Augustine, Offshore South Carolina (42)	Charleston SC, Wilmington NC, Cape Hatteras (255)	20% of Records	2005-present
Headboat Survey	1973-2009	Charleston SC, St. Augustine FL, Cape Canaveral FL (3,203)	Charleston SC (26,650)	2004-Present	None
RFOP	2006-2009	South Carolina and Georgia (13)	South Carolina (317)	Yes	Yes
MARMAP	1977-2009	South Carolina and Georgia (9)	South Carolina (30)	Yes	Yes
ALS	1962-2010	Florida Keys (2,309)	Florida Keys (2,145)	No	None
Georgia Trip Ticket	2004-2009	No Records	No location information	No	None
Florida Trip Ticket	1986-1992	Cape Canaveral (59,609)	Jacksonville (2,427)	No	None
South Carolina Trip Ticket	1989-2009	No location information	No location information	No	None
North Carolina Trip Ticket	1994-2010	Federal Waters (5)	Federal Waters (38)	No	None

- The cluster analyses displayed low association between warsaw grouper and speckled hind with blueline tilefish and snowy grouper. The low levels of association with blueline tilefish may be explained by the different habitat preferences of the species. Warsaw grouper inhabit steep cliffs, notches, and rocky ledges of the continental shelf break (Manooch and Mason 1987), and speckled hind inhabit high and low profile hard bottom (Huntsman and Dixon 1976). Blueline tilefish inhabit irregular bottoms comprised of troughs and terraces inter-mingled with sand, mud, or shell hash bottom where they live in burrows (Parker and Ross 1986; Parker and Mays 1998). Snowy grouper inhabit the upper continental slope, between 240 and 330 ft of depth, in habitats characterized by rocky ledges and swift currents (Matheson and Huntsman 1984). Although snowy grouper appear to occupy similar habitats to warsaw grouper and speckled hind, cluster analyses suggested co-occurrence of these species are rare.
- The cluster analysis results could have been biased because relatively little data was available beyond 240 feet. Warsaw grouper and speckled hind undergo an ontogenetic migration; as they mature, they move into deeper waters (Heemstra and Randall 1993;

Brule et al. 2000). Thus, the mature portion of the stock, which would suffer from higher release mortality due to deeper depth-at-encounter, is under-represented in the available data. The mature portion of the stock may also be under-represented relative to unfished conditions, as overfishing typically preferentially removes larger (e.g., older) individuals.

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Appendix C. Bycatch Practicability Analysis

1. Population Effects for Bycatch Species

Background

Regulatory Amendment 11 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Regulatory Amendment 11) includes actions to modify the 40-fathom closure off coast of the South Atlantic states. Modifications include reducing the number of deepwater species currently prohibited from retention and modifications to the boundaries of the 40-fathom closure. One alternative considers the complete removal of the 40-fathom closure. Species considered to be deepwater stocks include speckled hind, warsaw grouper, snowy grouper, blueline tilefish, yellowedge grouper, misty grouper, queen snapper, and silk snapper.

During 2005-2009, the commercial sector accounted for at least 50% of the landings for all deepwater species except warsaw grouper (**Table G-1**). Landings of blueline tilefish were evenly divided between the commercial and recreational sector during 2005-2009 (**Table G-1**). However, landings of blueline tilefish by the commercial sector has increased in recent years, while landings by the for-hire and private recreational sectors have recently decreased (**Figure G-1**).

Table G-1. Percentage of landings among the commercial, for-hire, private recreational sectors during 2005-2009.

Taxon	Commercial	For Hire	Private Recreational
blueline tilefish	50%	34%	16%
misty grouper	100%	0%	0%
queen snapper	94%	0%	6%
silk snapper	75%	24%	1%
snowy grouper	65%	23%	12%
speckled hind	51%	47%	2%
warsaw grouper	6%	26%	68%
yellowedge grouper	77%	2%	21%

Source: SEFSC ACL Dataset dated June 14, 2011

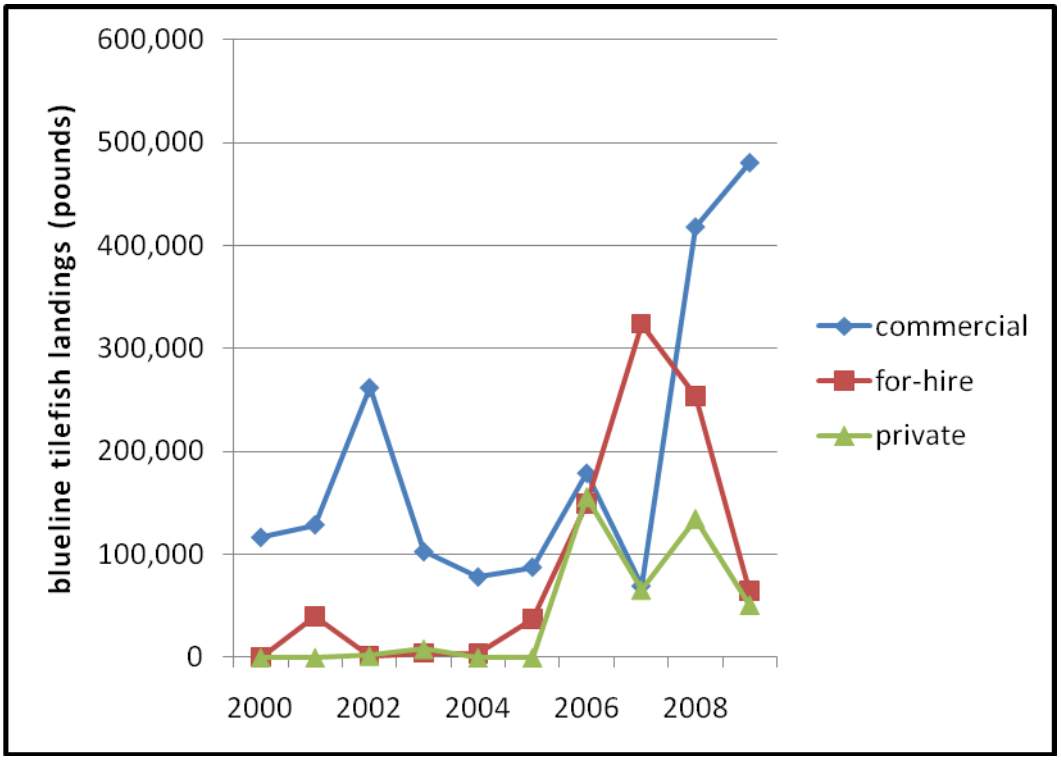

Figure G-1. Reported landings of blueline tilefish between 2000 and 2009 in the South Atlantic waters. Source: SEFSC ACL Dataset dated June 14, 2011

Commercial Fishery

During 2005 to 2009, approximately 20% of snapper grouper permitted vessels from the Gulf of Mexico and South Atlantic were randomly selected to fill out supplementary logbooks. The average number of trips per year during 2005 to 2009 was 13,973 (**Table G-2**). Fishermen spent an average of 1.69 days at sea per trip.

Table G-2. Snapper grouper fishery effort for South Atlantic.

YEAR	Trips	Days	Days per Trip
2005	13,771	22,855	1.66
2006	13,264	23,324	1.76
2007	14,885	24,509	1.65
2008	14,781	25,023	1.69
2009	15,345	25,487	1.66
Mean	13,973	23,563	1.69

Source: NMFS SEFSC Logbook Program.

For species in snapper grouper fishery management unit (FMU), the number of commercial trips that reported discards was greatest for yellowtail snapper, red porgy, vermilion snapper, scamp, and black sea bass (**Table G-3**). **Table G-3** indicates many other species not included in the

snapper grouper FMU including mackerel species, sharks, dolphin, and others are discarded by fishermen with federal commercial snapper grouper permits.

Table G-3. The 70 most commonly discarded species during 2005-2009 for the South Atlantic. Snapper grouper species are shaded in gray. Note: Represents total of unexpanded data during 2005-2009.

Species	Number of trips reported discarding the species	Number discarded
red porgy, unc	1,449	128,197
vermilion snapper	1,272	89,156
black sea bass, unc	896	69,027
knobbed porgy	503	27,924
yellowtail snapper	2,058	21,420
rough skin dogfish	85	14,807
red snapper	634	11,340
scamp	969	8,703
king mackerel	1,415	7,917
mangrove snapper	416	7,230
spottail pinfish	113	7,194
smooth dogfish	43	5,456
Atlantic sharpnose	204	5,055
menhaden	50	4,880
little tunny	140	4,189
greater amberjack	361	4,163
gag	618	4,045
grunts	181	3,517
dogfish shark	54	3,435
bluefish	77	3,092
red grouper	559	3,045
white grunt	168	2,695
gray triggerfish	233	2,508
scups or porgies, unc	73	2,495
blue runner	303	2,332
triggerfish	168	2,274
blacktip shark	161	2,098
amberjack	262	1,818
sandbar shark	129	1,810
black grouper	381	1,723
tomtate	22	1,703
tiger shark	115	1,506
mutton snapper	296	1,347
dolphin	214	1,270

Species	Number of trips reported discarding the species	Number discarded
unc, finfish for food	86	1,167
Atlantic bonito	218	1,049
speckled hind	122	817
remora	270	815
snappers, unc	36	681
barracuda	75	668
Spanish mackerel	106	651
ballyhoo	18	600
lane snapper	73	582
groupers	67	396
chubs	8	364
caribbean sharpnose	13	361
stingrays	29	335
hake	35	333
rays, unc	46	324
snowy grouper	59	319
margate	17	313
cobia	182	304
needlefish	72	299
cero	98	288
lesser amberjack	12	282
sand tilefish	35	264
spinner shark	33	245
hammerhead shark	69	218
almaco jack	20	203
sheepshead	21	201
sea catfish	69	188
rudderfish	33	181
black margate	3	161
yellowfin tuna	36	161
banded rudderfish	14	159
mahogany snapper	13	133
rock sea bass	11	131
squirrelfish	18	131
silky shark	13	114
Atlantic spadefish	21	107

Recreational Fishery

For the recreational fishery, estimates of the number of recreational discards are available from MRFSS and the NMFS headboat survey. The MRFSS system classifies recreational catch into three categories:

- Type A - Fishes that were caught, landed whole and available for identification and enumeration by the interviewers.
- Type B - Fishes that were caught but were either not kept or not available for identification:
    - Type B1 - Fishes that were caught and filleted, released dead, given away, or disposed of in some way other than Types A or B2.
    - Type B2 - Fishes that were caught and released alive.

For species in the Regulatory Amendment 11, the number of released fish, as reported by charterboat and private recreational fishermen, was greatest for blueline tilefish, snowy grouper, and speckled hind (**Table G-4**).

Table G-4. Estimated number of deepwater fish released (B2) in numbers for the South Atlantic during 2005-2009 as reported by charterboat and private recreational fishermen.

Species	Year: 2005		Year: 2006		Year: 2007		Year: 2008		Year: 2009		Year: 2010	
	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE
blueline tilefish	2,572	48.2	525	61.2	17,303	41.1	0	0	161	100	1,614	42.6
misty grouper	none reported											
queen snapper	0	0	none reported								0	0
silk snapper	473	100	0	0	0	0	1,439	54.4	964	100	118	72.8
snowy grouper	2,866	52.3	58	100.8	1,019	44.2	864	68.4	636	100	42	100.4
speckled hind	5,121	50.4	596	77.3	0	0	5,519	46.6	none reported		69	63.7
warsaw grouper	0	0	0	0	126	99.8	0	0	0	0	0	0
yellowedge grouper	0	0	none reported				0	0	0	0	0	0

Source: Marine Recreational Fisheries Statistics Survey Data Query Assessed July 8, 2011

The number of released fish for other species managed by the South Atlantic Council, as reported by charterboat and private recreational fishermen, varied by species (**Table G-5**).

Table G-5. Estimated number of fish released (B2) fish in numbers for the South Atlantic during 2005-2009.

Species	Year: 2005		Year: 2006		Year: 2007		Year: 2008		Year: 2009	
	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE
BARRACUDAS										
BARRACUDAS	126,721	10.8	180,157	8.7	268,282	9.5	239,534	9.6	204,545	9.8
-- Species Group Subtotal --	126,721	10.8	180,157	8.7	268,282	9.5	239,534	9.6	204,545	9.8
BLUEFISH										
BLUEFISH	3,004,781	6.1	3,707,415	5.7	4,539,620	6	3,440,594	5	2,337,256	5.4
-- Species Group Subtotal --	3,004,781	6.1	3,707,415	5.7	4,539,620	6	3,440,594	5	2,337,256	5.4
CARTILAGINOUS FISHES										
DOGFISH SHARKS	151,502	28.1	91,248	17.4	132,366	42.2	129,161	22.3	92,811	24.9
OTHER SHARKS	2,888,895	5.1	2,770,853	6.8	3,128,079	4.5	2,925,490	4.4	2,638,748	5.5
SKATES/RAYS	1,387,330	6.9	1,059,210	6.7	1,183,040	5.3	1,070,743	6.2	1,431,617	10.8
-- Species Group Subtotal --	4,427,727	4.1	3,921,311	5.1	4,443,485	3.7	4,125,394	3.6	4,163,176	5.1
CATFISHES										
FRESHWATER CATFISHES	64,895	28.1	40,805	30.2	20,552	25.6	45,502	28	12,530	35.4
SALTWATER CATFISHES	1,775,623	6.2	1,362,776	5.8	2,473,885	7.1	1,912,040	6.5	1,016,001	6.6
-- Species Group Subtotal --	1,840,518	6	1,403,581	5.7	2,494,437	7	1,957,542	6.3	1,028,531	6.6
CODS AND HAKES										
OTHER CODS/HAKES	34,531	40.3	5,889	37	9,605	31	7,405	69.3	32,350	39.9
-- Species Group Subtotal --	34,531	40.3	5,889	37	9,605	31	7,405	69.3	32,350	39.9
DOLPHINS										
DOLPHINS	218,931	16.1	231,853	10.8	254,568	17.1	200,879	11.8	75,493	14
-- Species Group Subtotal --	218,931	16.1	231,853	10.8	254,568	17.1	200,879	11.8	75,493	14
DRUMS										
ATLANTIC CROAKER	2,153,037	6.6	3,439,549	6.4	2,540,696	7	2,372,758	5.9	3,113,213	5.5
BLACK DRUM	190,110	11.4	312,415	9.7	820,032	10.2	640,413	7.7	293,214	8.8
KINGFISHES	2,226,960	6.8	3,582,622	7.7	3,309,945	5.9	2,902,539	6.1	2,710,822	6.8
OTHER DRUM	581,461	11	834,383	8.8	1,049,974	10.9	1,173,266	9.5	900,754	12.3
RED DRUM	2,412,470	5.8	2,111,089	5.6	2,070,575	5.6	2,333,096	6.1	1,979,705	5.6

Species	Year: 2005		Year: 2006		Year: 2007		Year: 2008		Year: 2009	
	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE
SAND SEATROUT	0	0	9,401	72	11,324	45.8	27,367	42.5	110,534	48.4
SILVER PERCH	480,503	13.2	726,915	11.5	584,828	12.1	491,659	15.6	595,518	15.6
SPOT	1,728,002	9.9	3,851,795	9.6	1,732,440	9.9	1,713,571	7.6	1,798,841	8.8
SPOTTED SEATROUT	5,336,913	5.3	4,988,541	4.7	6,114,718	5	4,715,679	5.5	3,782,693	5.4
WEAKFISH	438,519	11	538,799	11.4	346,898	14	265,383	14.1	189,614	21.8
-- Species Group Subtotal --	15,547,975	2.8	20,395,509	2.9	18,581,430	2.6	16,635,731	2.5	15,474,908	2.7
EELS										
EELS	51,553	26.3	62,029	25.8	43,847	16.3	41,653	19	27,700	17.3
-- Species Group Subtotal --	51,553	26.3	62,029	25.8	43,847	16.3	41,653	19	27,700	17.3
FLOUNDERS										
GULF FLOUNDER	4,932	64	10,047	58.5	32,472	49.1	6,181	51.8	964	100
OTHER FLOUNDERS	1,214,700	6.3	1,201,665	5.6	1,689,592	5.8	1,900,658	5.9	1,577,521	6.8
SOUTHERN FLOUNDER	131,274	17.9	257,712	13.7	190,340	13	125,290	14.8	104,871	23.9
SUMMER FLOUNDER	83,320	22.4	139,805	20.5	10,815	38.6	5,715	38	35,632	27.3
-- Species Group Subtotal --	1,434,226	5.7	1,609,229	5	1,923,219	5.4	2,037,844	5.6	1,718,988	6.4
GRUNTS										
OTHER GRUNTS	905,462	8.2	790,470	8.4	1,561,407	8.3	903,581	7.7	1,219,001	8.5
PIGFISH	743,829	7.8	553,384	9.6	868,092	10.3	821,930	8.4	841,230	10.1
WHITE GRUNT	195,770	14.8	274,926	15	241,875	11.3	434,040	14.5	148,501	24.3
-- Species Group Subtotal --	1,845,061	5.3	1,618,780	5.8	2,671,374	6	2,159,551	5.4	2,208,732	6.3
HERRINGS										
HERRINGS	1,243,180	17.4	2,640,817	12.5	1,203,718	16.9	512,502	31.7	1,698,306	15.3
-- Species Group Subtotal --	1,243,180	17.4	2,640,817	12.5	1,203,718	16.9	512,502	31.7	1,698,306	15.3
JACKS										
BLUE RUNNER	661,888	9.6	822,370	9.2	1,159,991	11.7	796,058	11.1	705,910	24.5
CREVALLE JACK	1,362,086	6.7	1,264,018	6.5	1,634,661	6	1,097,877	7	1,139,832	7.9
FLORIDA POMPANO	693,755	12.5	1,007,541	20.1	605,621	12	696,269	10.7	345,791	21.5
GREATER AMBERJACK	16,687	25.1	19,234	19.6	30,752	20.8	80,931	19.8	71,802	16.1
OTHER JACKS	332,217	17.4	180,298	14	326,798	15.8	433,050	12.2	352,874	16
-- Species Group Subtotal --	3,066,633	5	3,293,461	7.1	3,757,823	5.1	3,104,185	4.8	2,616,209	8.3
MULLETS										
MULLETS	1,384,536	13.7	1,801,720	11.3	2,263,848	9.4	1,091,237	10.7	1,367,241	11.1

Species	Year: 2005		Year: 2006		Year: 2007		Year: 2008		Year: 2009	
	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE
-- Species Group Subtotal --	1,384,536	13.7	1,801,720	11.3	2,263,848	9.4	1,091,237	10.7	1,367,241	11.1
OTHER FISHES										
OTHER FISHES	2,965,704	4.8	2,882,611	4.7	4,518,284	3.7	2,828,534	4.2	2,751,240	5.7
-- Species Group Subtotal --	2,965,704	4.8	2,882,611	4.7	4,518,284	3.7	2,828,534	4.2	2,751,240	5.7
PORGIES										
OTHER PORGIES	72,379	20.1	150,357	20.4	139,040	21.4	116,266	19.5	65,856	19.2
PINFISHES	3,917,568	5.8	5,056,606	6.2	4,960,818	5.1	5,040,941	6	3,588,516	5.8
RED PORGY	27,514	19.2	16,636	15.8	30,085	19	44,154	30	18,089	55.8
SCUP	1,620	46.5	7,721	44	5,729	30.6	9,755	36	3,293	25.3
SHEEPSHEAD	436,207	9.6	437,836	9.3	603,767	10.7	773,720	8	520,600	9.1
-- Species Group Subtotal --	4,455,288	5.2	5,669,156	5.6	5,739,439	4.5	5,984,836	5.2	4,196,354	5.1
PUFFERS										
PUFFERS	425,264	7.7	635,341	8.5	1,152,418	6.6	1,341,422	6.7	912,983	7.6
-- Species Group Subtotal --	425,264	7.7	635,341	8.5	1,152,418	6.6	1,341,422	6.7	912,983	7.6
SEA BASSES										
BLACK SEA BASS	2,483,947	5.5	2,967,099	5.6	3,764,105	7.3	2,940,795	6.2	2,716,240	6.2
EPINEPHELUS GROUPERS	254,936	9.1	165,261	9.1	107,240	17.6	97,808	11.9	128,065	11.9
MYCTEROPERCA GROUPERS	145,222	11	152,123	10.7	302,398	11.2	252,309	8.9	142,865	10.6
OTHER SEA BASSES	324,893	11.5	797,375	11.3	910,942	8.7	801,710	9.1	499,275	10.4
-- Species Group Subtotal --	3,208,998	4.5	4,081,858	4.6	5,084,685	5.7	4,092,622	4.8	3,486,445	5.1
SEAROBINS										
SEAROBINS	158,366	12.1	300,921	21.5	432,617	11.1	333,166	14.5	123,415	10.5
-- Species Group Subtotal --	158,366	12.1	300,921	21.5	432,617	11.1	333,166	14.5	123,415	10.5
SNAPPERS										
GRAY SNAPPER	1,228,211	7.8	1,457,251	5.9	2,936,755	6	1,839,406	6.5	1,725,889	7.4
LANE SNAPPER	111,276	22.7	137,572	16.8	330,770	14.1	227,775	18.4	157,594	16.6
OTHER SNAPPERS	242,324	10.6	280,948	10.1	426,284	10.4	557,020	10	314,681	10.1
RED SNAPPER	125,739	13.3	134,692	18.5	455,405	12.8	403,244	10.5	210,279	12.4
VERMILION SNAPPER	140,356	13.2	102,219	34.3	293,433	12.9	246,103	14.2	226,125	11.6
YELLOWTAIL SNAPPER	258,606	17.7	344,982	11.7	402,201	12.5	319,239	11.1	221,836	22.6
-- Species Group Subtotal --	2,106,512	5.5	2,457,664	4.5	4,844,848	4.3	3,592,787	4.3	2,856,404	5.2

Species	Year: 2005		Year: 2006		Year: 2007		Year: 2008		Year: 2009	
	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE	TYPE B2	PSE
TEMPERATE BASSES										
STRIPED BASS	136,536	16.3	85,438	19.4	50,735	18.2	86,858	19.6	93,353	21
WHITE PERCH	0	0	46,904	38.1	7,339	56.8	1,397	58.5	0	0
-- Species Group Subtotal --	136,536	16.3	132,342	18.4	58,074	17.5	88,255	19.4	93,353	21
TOADFISHES										
TOADFISHES	477,955	8.3	479,125	9.4	435,924	7.7	691,142	8	405,848	8.2
-- Species Group Subtotal --	477,955	8.3	479,125	9.4	435,924	7.7	691,142	8	405,848	8.2
TRIGGERFISHES/FILEFISHES										
TRIGGERFISHES/FILEFISHES	239,995	10.7	210,123	14.6	228,262	10.1	199,476	10.7	181,503	14
-- Species Group Subtotal --	239,995	10.7	210,123	14.6	228,262	10.1	199,476	10.7	181,503	14
TUNAS AND MACKERELS										
ATLANTIC MACKEREL	67,658	81.9								
KING MACKEREL	207,618	13.7	195,618	9.8	303,008	9.4	166,716	9.7	127,316	13.4
LITTLE TUNNY/ATLANTIC BONITO	288,459	8.5	476,296	7	780,193	8.4	511,878	7.6	585,015	8.3
OTHER TUNAS/MACKERELS	66,422	24.6	43,933	13.7	58,912	16.3	121,352	17.4	93,887	17
SPANISH MACKEREL	704,569	12.9	321,860	11.9	586,722	9.4	994,693	10.4	466,681	9.4
-- Species Group Subtotal --	1,334,726	8.5	1,037,707	5.3	1,728,835	5.3	1,794,639	6.3	1,272,899	5.4
WRASSES										
OTHER WRASSES	2,966	53.3	2,079	50.4	10,386	41.8	13,203	51.5	2,977	42.4
TAUTOG	2,885	100	5,185	52	2,905	60.9	1,755	58.9	1,922	62.6
-- Species Group Subtotal --	5,851	56.2	7,264	39.8	13,291	35.3	14,958	46	4,899	35.6
-- Grand Total --	49,741,568	1.4	58,765,863	1.6	66,691,933	1.3	56,515,888	1.3	49,238,778	1.5

Source: MRFSS Web Site http://www.st.nmfs.noaa.gov/st1/recreational/overview/overview.html.

For species in the Regulatory Amendment 11, the number of released fish, as reported by headboat operators, was greatest for blueline tilefish, snowy grouper, and speckled hind (**Table G-6**).

Table G-6. Number of deepwater fish released fish in numbers for the South Atlantic during 2005-2009 as reported headboat operators.

Species	# trips reporting discards	released	sum
blueline tilefish	107	rel_dead	1
		rel_live	12
misty grouper	0	rel_dead	0
		rel_live	0
queen snapper	0	rel_dead	0
		rel_live	0
silk snapper	243	rel_dead	28
		rel_live	330
snowy grouper	225	rel_dead	5
		rel_live	194
speckled hind	481	rel_dead	2
		rel_live	258
warsaw grouper	258	rel_dead	5
		rel_live	154
yellowedge grouper	17	rel_dead	0
		rel_live	23

Source: NMFS Headboat survey

The number of discarded species, for other fish managed by the South Atlantic Council, as reported by headboat operators, varied by species (**Table G-7**).

Table G-7. Most commonly discarded species from headboats in South Atlantic. Total fish reported released alive or dead on sampled headboat trips during 2005-2009. Data are not expanded to all trips.

Species	# trips reporting discards	released	sum
black sea bass	17,087	rel_dead	18,316
		rel_live	721,640
vermilion snapper	11,601	rel_dead	19,013
		rel_live	413,854
tomtate	7,801	rel_dead	34,943
		rel_live	243,869
red snapper	9,198	rel_dead	3,214
		rel_live	212,572
red porgy	3,848	rel_dead	2,400

Species	# trips reporting discards	released	sum
		rel_live	110,940
		rel_dead	3,005
yellowtail snapper	11,797	rel_live	103,625
		rel_dead	3,154
white grunt	12,917	rel_live	91,647
		rel_dead	2,850
pinfish	3,000	rel_live	81,423
		rel_dead	477
sharpnose shark	10,928	rel_live	82,816
		rel_dead	199
spottail pinfish	3,450	rel_live	35,381
		rel_dead	317
red grouper	7,885	rel_live	27,527
		rel_dead	339
gag	9,520	rel_live	20,393
		rel_dead	380
gray triggerfish	14,291	rel_live	18,599
		rel_dead	591
lane snapper	7,506	rel_live	17,561
		rel_dead	275
scamp	4,809	rel_live	16,123
		rel_dead	763
bank sea bass	2,903	rel_live	13,725
		rel_dead	137
gray snapper	10,376	rel_live	13,744
		rel_dead	513
mutton snapper	8,907	rel_live	13,030
		rel_dead	155
squirrelfish	3,012	rel_live	9,688
		rel_dead	298
bluerunner	3,958	rel_live	8,439
		rel_dead	865
scup	1,187	rel_live	7,402
		rel_dead	104
greater amberjack	4,438	rel_live	8,155
		rel_dead	31
smooth dogfish	865	rel_live	6,830
		rel_dead	219
little tunny	4,019	rel_live	6,620
		rel_dead	232
king mackerel	10,764	rel_live	5,913

Species	# trips reporting discards	released	sum
banded rudderfish	2,333	rel_dead	31
		rel_live	5,426
inshore lizardfish	1,126	rel_dead	53
		rel_live	4,804
spanish mackerel	2,117	rel_dead	154
		rel_live	4,380
remora	1,408	rel_dead	65
		rel_live	4,139
bluefish	1,420	rel_dead	412
		rel_live	3,728
bluestriped grunt	2,283	rel_dead	173
		rel_live	3,650
blacktip shark	1,001	rel_dead	18
		rel_live	3,729
porkfish	1,645	rel_dead	67
		rel_live	3,429
black grouper	2,530	rel_dead	49
		rel_live	3,026
nurse shark	1,730	rel_dead	64
		rel_live	2,964
graysby	2,736	rel_dead	213
		rel_live	2,699
cobia	3,925	rel_dead	17
		rel_live	2,771
sand perch	1,017	rel_dead	195
		rel_live	2,279
rock hind	1,998	rel_dead	290
		rel_live	1,663
doctorfish	873	rel_dead	60
		rel_live	1,790
almaco jack	2,652	rel_dead	24
		rel_live	1,768
sandbar shark	393	rel_dead	1
		rel_live	1,694
margate	744	rel_dead	75
		rel_live	1,540
dolphin	3,087	rel_dead	45
		rel_live	1,370
bigeye	2,098	rel_dead	39
		rel_live	1,231
whitebone porgy	4,480	rel_dead	32

Species	# trips reporting discards	released	sum
		rel_live	1,204
		rel_dead	0
spiny dogfish	58	rel_live	1,201
		rel_dead	80
jolthead porgy	3,667	rel_live	1,054
		rel_dead	47
great barracuda	2,085	rel_live	1,079
		rel_dead	11
pigfish	1,072	rel_live	996
		rel_dead	55
rainbow runner	669	rel_live	811
		rel_dead	40
sand tilefish	872	rel_live	823
		rel_dead	0
atlantic croaker	39	rel_live	843
		rel_dead	26
knobbed porgy	3,890	rel_live	554
		rel_dead	0
crevalle jack	265	rel_live	564

Source: NMFS Headboat survey.

Finfish Bycatch Mortality

Release mortality rates are unknown for most snapper grouper species. Recent SEDAR assessments include estimates of release mortality rates based on published studies. Stock assessment reports can be found at http://www.sefsc.noaa.gov/sedar/.

Practicability of Management Measures in Directed Fisheries Relative to their Impact on Bycatch and Bycatch Mortality

Tables G-3 through G-7 list the species that are most commonly discarded by commercial and recreational fishermen.

The purpose of Regulatory Amendment 11 is to modify regulations pertaining to the deepwater species in order to reduce the socio-economic effects expected from the regulations in Amendment 17B to the Snapper Grouper FMP while maintaining the biological protection to speckled hind and warsaw grouper in the South Atlantic to the extent practicable. Amendment 17B established a harvest prohibition for six deepwater species with the intent of reducing bycatch mortality of speckled hind and warsaw grouper, which could be taken incidentally when the six deepwater species are targeted. **Alternatives 2-11** would modify the 240-foot (40-fathom) closure established through Amendment 17B. **Alternatives 2-5** would exempt blueline tilefish from the harvest prohibition deeper than 240 feet; whereas, **Alternatives 7-10** would

exempt snowy grouper from these regulations. **Alternative 6** would open the closed area for deepwater snapper grouper species in the South Atlantic seaward of 500 feet and maintain a closed area from 240 to 500 feet. The South Atlantic Council is considering **Alternative 6** as some fishermen from the Florida Keys have stated that they do not catch warsaw grouper and speckled hind in waters deeper than a 500 feet while they fish for snowy grouper and blueline tilefish. **Alternative 11 (Preferred)** would remove the 240-foot (40-fathom) closure from the regulations. The South Atlantic Council's Scientific and Statistical Committee, as well as the Snapper Grouper Advisory Panel, indicated the 40-fathom closure established in Amendment 17B could increase negative biological harm to speckled hind and warsaw grouper by increasing fishing pressure at the shelf edge (160 feet; 27 fathoms), which is the nursery area and zone of greatest abundance for these species. Therefore, the South Atlantic Council chose **Alternative 11** as their preferred alternative and decided to provide protection for speckled hind and warsaw grouper through the expansion of existing marine protected areas (MPAs) or establishment of new MPAs.

Allowing retention of deepwater species when fishing beyond a 240-foot depth (**Alternatives 2-11**) would result in increased fishing mortality to the deepwater species. Prior to the 40-fathom closure, commercial blueline tilefish landings had been increasing in recent years, particularly off Cape Hatteras, North Carolina. Fishermen have testified that the 40-fathom closure has resulted in the cancellation of trips as they are no longer economically-feasible. Therefore, the modification or removal of the closure as proposed in Regualtory Amendment 11 would re-open the North Carolina blueline tilefish fishery, which had been limited since the closure was implemented in early 2010; such action would increase the current level of fishing mortality to the deepwater species, particularly blueline tilefish. In addition, the alternatives could increase the discard mortality levels to snowy grouper since the trip limit is 100 pounds gutted weight. However, fishermen have reported that they fish in specific areas to avoid snowy grouper once the 100 pound trip limit is reached. In addition, discards of undersized silk snappers may increase as the minimum size limit is 12 inches.

Recent data analyses suggest speckled hind and warsaw grouper rarely co-occur with snowy grouper, blueline tilefish, yellowedge grouper, misty grouper, queen snapper, or silk snapper. These recent analyses are contained in a report produced by NMFS titled "Regulatory Amendment 11: Warsaw Grouper and Speckled Hind Catches in the U.S. South Atlantic." Based upon the results, it appears unlikely that the allowance of blueline tilefish harvest north of Cape Hatteras would result in significant increases in the mortality of speckled hind or warsaw grouper.

Snapper Grouper Amendment 14 implemented deepwater MPAs that contain many species, including blueline tilefish, speckled hind, and warsaw grouper. Snapper Grouper Amendment 16 required the use of dehooking devices, which could help reduce bycatch of species caught. Dehooking devices can allow fishermen to remove hooks with greater ease and more quickly from snapper grouper species without removing the fish from the water. If a fish does need to be removed from the water, dehookers could still reduce handling time in removing hooks, thus increasing survival (Cooke *et al.* 2001). Furthermore, Snapper Grouper Amendment 17A required circle hooks for snapper-grouper species north of 28 degrees latitude, which is expected to reduce bycatch mortality of snapper grouper species. Recent amendments have reduced the

recreational bag limit of snowy grouper to one per vessel per day and implemented a 100 pound gutted weight commercial trip limt for snowy grouper. Such measures could be expected to decrease the incentive to fish in areas where snowy groupers are encountered.

2. Ecological Effects Due to Changes in the Bycatch

The ecological effects of bycatch mortality are the same as fishing mortality from directed fishing efforts. If not properly managed and accounted for, either form of mortality could potentially reduce stock biomass to an unsustainable level. Actions proposed in Regulatory Amendment 11 could increase bycatch of snowy grouper if fishermen continue to encounter snowy grouper after the 100 pound gutted weight trip limit is reached. Many of the species in the snapper grouper fishery management unit have spatial and temporal coincidence and the benefits could be shared among them.

3. Changes in the Bycatch of Other Fish Species and Resulting Population and Ecosystem Effects

Actions proposed in Regulatory Amendment 11 could increase bycatch of snowy grouper if fishermen continue to encounter snowy grouper after the 100 pound gutted weight trip limit is reached. However, fishermen have reported that they fish in specific areas to avoid snowy grouper once the 100 pound gutted weight trip limit is reached. In addition, Amendment 17B reduced the recreational bag limit of snowy grouper to one per vessel per day. Such measures could be expected to decrease the incentive to fish in areas where snowy groupers are encountered. Through elimination of the 40-fathom closure, Regulatory Amendment 11 could reduce fishing pressure at the shelf edge, which serves as a nursery area for speckled hind and warsaw grouper. Therefore, positive biological effects could be expected for speckled hind and warsaw through a reduction in the magnitude of bycatch. The South Atlantic Council will be considering MPAs as an option to provide additional protection to reduce the incendental catch of warsaw grouper and speckled hind. Many of the species in the snapper grouper fishery management unit have spatial and temporal coincidence and the benefits could be shared among them. Ecological changes in the community structure of reef ecosystems through the proposed actions could be expected to occur. These ecological changes could affect the nature and magnitude of bycatch over time.

4. Effects on Marine Mammals and Birds

Under Section 118 of the Marine Mammal Protection Act (MMPA), NMFS must publish, at least annually, a List of Fisheries (LOF) that places all U.S. commercial fisheries into one of three categories based on the level of incidental serious injury and mortality of marine mammals that occurs in each fishery. Of the gear utilized within the snapper grouper fishery, only the black sea bass pot is considered to pose an entanglement risk to marine mammals. The southeast U.S. Atlantic black sea bass pot fishery is included in the grouping of the Atlantic mixed species trap/pot fisheries, which the 2012 proposed List of Fisheries classifies as a Category II (76 FR 37716; June 28, 2011). Gear types used in these fisheries are determined to have occasional

incidental mortality and serious injury of marine mammals. For the snapper grouper fishery, the best available data on protected species interactions are from the Southeast Fisheries Science Center (SEFSC) Supplementary Discard Data Program (SDDP) initiated in July of 2001 and sub-samples 20% of the vessels with an active permit. Since August 2001, only three interactions with marine mammals have been documented; each was taken by handline gear and each released alive (McCarthy SEFSC database). The bottom longline/hook-and-line component of the South Atlantic snapper grouper fishery remains a Category III under the LOF.

Although the black sea bass pot fishery can pose an entanglement risk to large whales due to their distribution and occurrence, sperm, fin, sei, and blue whales are unlikely to overlap with the black sea bass pot fishery operated within the snapper grouper fishery since it is executed primarily off North Carolina and South Carolina in waters ranging from 70-120 feet deep (21.3-36.6 meters). There are no known interactions between the black sea bass pot fishery and large whales. NOAA Fisheries Service's biological opinion on the continued operation of the South Atlantic snapper grouper fishery determined the possible adverse effects resulting from the fishery are extremely unlikely. Thus, the continued operation of the snapper grouper fishery in the southeast U.S. Atlantic EEZ is not likely to adversely affect sperm, fin, sei, and blue whales (NMFS 2006).

North Atlantic right and humpback whales may overlap both spatially and temporally with the black sea bass pot fishery. Recent revisions to the Atlantic Large Whale Take Reduction Plan have folded the Atlantic mixed species trap/pot fisheries into the plan (72 FR 193; October 5, 2007). The new requirements will help further reduce the likelihood of North Atlantic right and humpback whale entanglement in black sea bass pot gear.

The Bermuda petrel and roseate tern occur within the action area. Bermuda petrels are occasionally seen in the waters of the Gulf Stream off the coasts of North Carolina and South Carolina during the summer. Sightings are considered rare and only occurring in low numbers (Alsop 2001). Roseate terns occur widely along the Atlantic coast during the summer but in the southeast region, they are found mainly off the Florida Keys (unpublished USFWS data). Interaction with fisheries has not been reported as a concern for either of these species.

Fishing effort reductions have the potential to reduce the amount of interactions between the fishery and marine mammals and birds. Although, the Bermuda petrel and roseate tern occur within the action area, these species are not commonly found and neither has been described as associating with vessels or having had interactions with the snapper grouper fishery. Thus, it is believed that the snapper grouper fishery is not likely to negatively affect the Bermuda petrel and the roseate tern.

5. Changes in Fishing, Processing, Disposal, and Marketing Costs

Actions in Regulatory Amendment 11 would be expected to affect the cost of fishing operations. It is likely that all four states (NC, SC, GA & FL) would be affected by the regulations. Additionally, factors such as waterfront property values, availability of less expensive imports, etc. may affect economic decisions made by recreational and commercial fishermen. Amendment 18A (under development) proposes to enhance current data collection programs.

This might provide more insight in calculating the changes in fishing, processing, disposal and marketing costs.

6. Changes in Fishing Practices and Behavior of Fishermen

Actions proposed in Regulatory Amendment 11 could result in a modification of fishing practices by commercial and recreational fishermen, thereby affecting the magnitude of discards. However, it is difficult to quantify any of the measures in terms of reducing discards until the magnitude of bycatch has been monitored over several years.

7. Changes in Research, Administration, and Enforcement Costs and Management Effectiveness

Research and monitoring is needed to understand the effectiveness of proposed management measure in reducing bycatch. Additional work is needed to determine the effectiveness of measures in the Regulatory Amendment 11, recently implemented amendments, and by future actions being proposed by the South Atlantic Council to reduce bycatch. Amendment 18A is being developed, which proposes to enhance current data collection programs. Some observer information has recently been provided by MARFIN and Cooperative Research Programs but more is needed. Approximately 20% of commercial fishermen are asked to fill out discard information in logbooks; however, a greater percentage of fishermen could be selected with emphasis on individuals that dominate landings. The use of electronic logbooks could be enhanced to enable fishery managers to obtain information on species composition, size distribution, geographic range, disposition, and depth of fishes that are released. Additional administrative and enforcement efforts will be needed to implement and enforce these regulations. NOAA Fisheries Service established the South East Fishery-Independent Survey in 2010 to strengthen fishery-independent sampling efforts in southeast US waters, addressing both immediate (e.g., red snapper) and long-term fishery-independent data needs, with an overarching goal of improving fishery-independent data utility for stock assessments. Meeting these data needs is critical to improving scientific advice to the management process, ensuring overfishing does not occur, and successfully rebuilding overfished stocks on schedule.

8. Changes in the Economic, Social, or Cultural Value of Fishing Activities and Non-Consumptive Uses of Fishery Resources

Preferred management measures, including those that are likely to increase or decrease discards could result in social and/or economic impacts as discussed in **Section 4**.

9. Changes in the Distribution of Benefits and Costs

The purpose of Regulatory Amendment 11 is to modify regulations pertaining to the deepwater species in order to reduce the socio-economic effects expected from the regulations in Amendment 17B to the Snapper Grouper FMP while maintaining the biological protection to speckled hind and warsaw grouper in the South Atlantic to the extent practicable. Such action would be expected to result in economic gain for those fishermen most affected by the 40-fathom closure implemented in early 2010.

10. Social Effects

The social effects of all the management measure, including those most likely to reduce bycatch, are described in **Section 4**.

11. Conclusion

This section evaluates the practicability of taking additional action to minimize bycatch and bycatch mortality using the ten factors provided at 50 CFR 600.350(d)(3)(i). In summary, the actions in Regulatory Amendment 11 could increase the discard mortality levels to snowy grouper since the trip limit is 100 pounds gutted weight. However, fishermen have reported that they fish in specific areas to avoid snowy grouper once the 100 pound gutted weight trip limit is reached. In addition, Amendment 17B reduced the recreational bag limit of snowy grouper to one per vessel per day. Such measures could be expected to decrease the incentive to fish in areas where snowy groupers are encountered. Regulatory Amendment 11 could reduce fishing pressure at the shelf edge (27 fathoms) where speckled hind and warsaw grouper are most abundant. Therefore, removal of the 240-foot (40-fathom) closure could reduce bycatch of speckled hind and warsaw grouper. Also, the requirements of dehooking devices, circle hooks, a recreational/commercial seasonal closure for shallow water groupers, reduction of recreational bag limits, and closing all shallow water groupers when a gag quota is met could also help to reduce bycatch of deepwater species, particulary those fish at younger life stages.

APPENDIX D

REGULATORY IMPACT REVIEW

1.0 Introduction

The NMFS requires a RIR for all regulatory actions that are of public interest. The RIR does three things: (1) it provides a comprehensive review of the level and incidence of impacts associated with a regulatory action; (2) it provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives which could be used to solve the problem; and (3) it ensures that the regulatory agency systematically and comprehensively considers all available alternatives so that the public welfare can be enhanced in the most efficient and cost effective way.

The RIR also serves as the basis for determining whether any proposed regulations are a "significant regulatory action" under certain criteria provided in Executive Order 12866 (E.O. 12866) and whether the approved regulations will have a "significant economic impact on a substantial number of small business entities" in compliance with the Regulatory Flexibility Act of 1980 (RFA).

1.1 Problems and Objectives

The purpose and need, issues, problems, and objectives of the proposed Amendment are presented in Section 2.0 and are incorporated herein by reference. In summary, the purpose for this regulatory amendment is to implement management measures for the South Atlantic Snapper Grouper Fishery that will modify the present 40 fathom closure that was imposed under Snapper Grouper Amendment 17B. Beginning January 31, 2011, possession of deepwater snapper-grouper species in or from the South Atlantic EEZ in depths greater than 40 fathoms (240 feet) has been prohibited. This regulatory amendment will remove snowy grouper, blueline tilefish, yellowedge grouper, misty grouper, queen snapper, and silk snapper from that prohibition.

1.2 Methodology and Framework for Analysis

This RIR assesses management measures from the standpoint of determining the resulting changes in economic costs and benefits to society.

1.3 Description of Fisheries

The South Atlantic snapper-grouper fishery is described in Section 3.3 of this document and in Snapper Grouper Amendments 17A (SAFMC 2010a) and 17B (SAFMC 2010b), and the remainder of this description is incorporated herein by reference.

1.4 Impacts of Management Measures

The two proposed actions would reduce the restrictions imposed by Regulatory Amendment 17B (SAFMC 2010b). Since January 31, 2011, fishing for, possession, and retention of deepwater species (snowy grouper, blueline tilefish, yellowedge grouper, warsaw grouper, speckled hind, misty grouper, queen snapper, and silk snapper) in the South Atlantic EEZ beyond a depth of 240 feet (40 fathoms; 73 m) has been prohibited (Amendment 17B; SAFMC 2010b). Action 1 would remove the following species from that prohibition: snowy grouper, blueline tilefish, yellowedge grouper, misty grouper, queen snapper, and silk snapper. Action 2 would address the ban on vessels transiting through the closure with prohibited species on board.

The RIR for Amendment 17B (SAFMC 2010b) estimated the adverse economic impact of the prohibition on fishing for, possession and retention of these six species in the closed area would be a $348,076 (2008 dollars) reduction in ex-vessel revenues annually (Table 1). Therefore, the proposed alternative in Action 1 would restore these landings and associated ex-vessel revenue, yielding an average economic benefit of $348,076 annually, assuming the previous estimate is representative of average annual loss. If that figure underestimates the cost of the prohibition, the economic benefit of Action 1 would be greater than $348,076 annually. Similarly, if that figure overestimates the cost of the prohibition, the annual economic benefit of Action 1 would be less than $348,076.

Table 1. 2007 Landings and Ex-Vessel Value (2008 dollars) of Six Species. Source: Amendment 17B.

Species	Landings (Pounds Gutted Weight)	Ex-Vessel Value (Dollars)	Ave Price per Pound
Snowy Grouper	79,607	247,970	3.11
Blueline Tilefish	59,875	88,102	1.47
Yellowedge Grouper	2,162	7,202	3.33
Misty Grouper	0	0	NA
Queen Snapper	0	0	NA
Silk Snapper	1,781	4,802	2.70
TOTAL	143,425	348,076	2.43

The proposed alternative for Action 2 would maintain a prohibition on transit through the closed area with prohibited species onboard. As a result, if the closed area remained in effect, the proposed action may increase transportation costs because vessels with prohibited species would be required to navigate around the closure. However, because the proposed closure action is to eliminate the 240-foot (40-fathom) closed area, the proposed alternative for Action 2 is not

relevant and maintaining the transit prohibition would not be expected to result in any adverse economic impacts.

1.5 Public and Private Costs of Regulations

The preparation, implementation, enforcement, and monitoring of this or any Federal action involves the expenditure of public and private resources which can be expressed as costs associated with the regulations. Costs associated with this amendment include:

Council costs of document preparation, meetings, public hearings, and information dissemination……...…….. $400,000

NOAA Fisheries administrative costs of document preparation, meetings and review $360,000

Annual law enforcement costs $0

TOTAL $760,000

Law enforcement currently monitors regulatory compliance in the snapper grouper fishery under routine operations and does not allocate specific budgetary outlays to individual fisheries, nor are increased enforcement budgets expected to be requested to address components of this action.

1.6 Determination of Significant Regulatory Action

Pursuant to Executive Order (E.O.) 12866, a regulation is considered a "significant regulatory action" if it: (1) has an annual effect on the economy of $100 million or more or adversely affects in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or state, local, or tribal governments or communities; (2) creates a serious inconsistency or otherwise interferes with an action taken or planned by another agency; (3) materially alters the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or (4) raises novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in E.O. 12866.

Because the proposed regulatory action will not meet any of the conditions listed above, it is determined that the proposed rule, if implemented, would not constitute a "significant regulatory action" under E.O. 12866.

1.7 References

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

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

APPENDIX E

REGULATORY FLEXIBILITY ACT ANALYSIS

1.0 Introduction

The purpose of the Regulatory Flexibility Act (RFA) is to establish a principle of regulatory issuance that agencies shall endeavor, consistent with the objectives of the rule and applicable statutes, to fit regulatory and informational requirements to the scale of businesses, organizations, and governmental jurisdictions subject to regulation. To achieve this principle, agencies are required to solicit and consider flexible regulatory proposals and to explain the rationale for their actions to assure that such proposals are given serious consideration. The RFA does not contain any decision criteria; instead, the purpose of the RFA is to inform the agency, as well as the public, of the expected economic impacts of the alternatives contained in the FMP or amendment (including framework management measures and other regulatory actions) and to ensure that the agency considers alternatives that minimize the expected impacts while meeting the goals and objectives of the FMP and applicable statutes.

With certain exceptions, the RFA requires agencies to conduct a regulatory flexibility analysis for each proposed rule. The regulatory flexibility analysis is designed to assess the impacts various regulatory alternatives would have on small entities, including small businesses, and to determine ways to minimize those impacts. In addition to analyses conducted for the RIR, the initial regulatory flexibility analysis (IRFA) provides: (1) a description of the reasons why action by the agency is being considered; (2) a succinct statement of the objectives of, and legal basis for the proposed rule; (3) an identification, to the extent practicable, of all relevant Federal rules which may duplicate, overlap, or conflict with the proposed rule; (4) a description and, where feasible, an estimate of the number of small entities to which the proposed rule will apply; (5) a description of the projected reporting, record-keeping, and other compliance requirements of the final rule, including an estimate of the classes of small entities which will be subject to the requirements of the report or record; and (6) a description of significant alternatives to the proposed rule which accomplish the stated objectives of applicable statues and which minimize any significant economic impact of the proposed rule on small entities.

1.1 Statement of need for, objectives of, and legal basis for the proposed rule

The purpose and need, issues, problems, and objectives of the proposed Amendment are presented in Section 1.2 and are incorporated herein by reference.

1.2 Identification of federal rules which may duplicate, overlap or conflict with the proposed rule.

No federal rules have been identified that may duplicate, overlap or conflict with the proposed actions.

1.3 Description of the projected reporting, record-keeping and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirement and the type of professional skills necessary for the preparation of the report or records.

The two proposed actions would reduce prohibitions and associated costs imposed by Amendment 17B (SAFMC 2010). Since January 31, 2011, fishing for, possession, and retention of snowy grouper, blueline tilefish, yellowedge grouper, warsaw grouper, speckled hind, misty grouper, queen snapper, and silk snapper in the South Atlantic EEZ beyond a depth of 240 feet (40 fathoms; 73 m) has been prohibited (Amendment 17B; SAFMC 2010). Action 1 would remove the following species from that prohibition: snowy grouper, blueline tilefish, yellowedge grouper, misty grouper, queen snapper, and silk snapper. Action 2 would remove the ban on vessels transiting through the closure with prohibited species on board that were legally harvested outside the closure.

1.4 Description and estimate of the number of small entities to which the proposed rule will apply.

This proposed rule would apply to small businesses that harvest snowy grouper, blueline tilefish, yellowedge grouper, misty grouper, queen snapper and silk snapper and other prohibited snapper grouper species. These small businesses are in Finfish Fishing (NAICS 114111) and Charter Fishing (NAICS 487210). The Finfish Fishing Industry has an SBA size standard of $4.0 million in annual receipts, and the Charter Fishing Industry's size standard is $7 million in annual receipts.

A limited access program with two types of permits was implemented for the commercial snapper grouper fishery in 1998. The number of vessels with transferable permits that allow an unlimited harvest per trip declined from 938 in 1999 to 718 in 2007, and those with non-transferable permits with a 225-pound trip limit declined year-by-year from 313 in 1999 to 159 in 2007 (Table 1). The number of transferable permits declined, in part, because new entrants into the fishery must buy two permits and retire one as the condition for entry into the fishery. Not all vessels with the permits landed snapper grouper species. On average, while there were 944 vessels with permits, 890 landed snapper grouper species from 2003 to 2007.

Table 1. Number of vessels that harvest snapper grouper in South Atlantic, 2003 - 2007. Source: Table 3-4, Snapper Grouper Amendment 17B (SAFMC 2010).

Number of Vessels	Year					Average
	2003	2004	2005	2006	2007	
With Permits	1,059	1,001	909	874	877	944
Landing Snapper Grouper	931	905	857	868	889	890
Percent Landing Snapper Grouper	87.9%	90.4%	94.3%	99.3%	101.4%	94.3%
With Transferable Permits	828	782	721	697	718	749
With Non-Transferable Permits	231	219	188	177	159	195

Charter fishing vessels in the South Atlantic are required to have a snapper grouper for-hire permit to fish for or possess snapper grouper species in the EEZ, and some vessels with commercial permits also have for-hire permits. From 2003 to 2007, an average of 231 vessels had both permits, and approximately 62 percent of these vessels had home ports in Florida, 19 percent in North Carolina and 15 percent in South Carolina (Table 2).

Table 2. Number of vessels with for-hire and commercial snapper grouper permits, 2003 – 2007. Source: Table 3-46, Snapper Grouper Amendment 17B (SAFMC 2010).

Home Port State	Number of Vessels With Both For-Hire & Commercial Permits						
	2003	2004	2005	2006	2007	Avg.	% Avg.
Florida	148	151	148	151	122	144	62.4%
North Carolina	45	42	43	46	40	43	18.7%
South Carolina	34	33	33	34	40	35	15.1%
Georgia	4	2	2	2	3	3	1.1%
Virginia	0	4	3	2	0	2	0.8%
Other States	8	3	5	3	2	4	1.8%
Gulf States	0	0	0	0	0	0	0.0%
Total	239	235	234	238	207	231	100.0%

There are substantially more vessels with for-hire permits than with commercial permits because it is not managed under a limited access program. The number of vessels with for-hire permits increased over the 5-year period from 2003 to 2007. Approximately 66 percent of the vessels have home ports in Florida and another 23 percent are home ported in the Carolinas (Table 3).

Table 3. Number of vessels with for-hire snapper grouper permit, 2003 – 2007. Source: Table 3-46, Snapper Grouper Amendment 17B (SAFMC 2010).

Home Port State	Number of Vessels With For-Hire Permit						
	2003	2004	2005	2006	2007	Avg.	% Avg.
Florida	957	1,084	1,119	1,108	1,140	1,082	66.1%
North Carolina	206	232	264	284	315	260	15.9%
South Carolina	122	108	121	119	129	120	7.3%
Georgia	36	27	33	33	30	32	1.9%
Virginia	5	13	10	10	8	9	0.6%
Other States	69	48	51	62	69	60	3.7%
Gulf States	82	82	79	65	63	74	4.5%
Total	1,477	1,594	1,677	1,681	1,754	1,637	100.0%

Over the 5-year period from 2003 to 2007, an average of 890 vessels landed 6.43 million pounds of snapper grouper and 1.95 million pounds of other species on snapper grouper trips. Total dockside revenues from snapper grouper species stood at $13.81 million (2007 dollars) and from other species, at $2.30 million (2007 dollars). Considering revenues from both snapper grouper and other species, the revenues per vessel would be $18,101. An average of 27 vessels per year harvested more than 50,000 pounds of snapper grouper species per year, generating at least, at an average price of $2.15 (2007 dollars) per pound, dockside revenues of $107,500. Vessels that operate in the snapper grouper fishery may also operate in other fisheries, the revenues of which cannot be determined with available data and are not reflected in these totals. Nonetheless, it is assumed here that all of the businesses in the finfish fishing industry have annual receipts below the size standard and are small businesses. Similarly, it is presumed that the businesses in the charter fishing industry are small entities.

1.5 Impacts of proposed management measures

The two proposed actions would reduce the restrictions imposed by Regulatory Amendment 17B (SAFMC 2010). Since January 31, 2011, fishing for, possession, and retention of deepwater species (snowy grouper, blueline tilefish, yellowedge grouper, warsaw grouper, speckled hind, misty grouper, queen snapper, and silk snapper) in the South Atlantic EEZ beyond a depth of 240 feet (40 fathoms; 73 m) has been prohibited (Amendment 17B; SAFMC 2010). Action 1 would remove the following species from that prohibition: snowy grouper, blueline tilefish, yellowedge grouper, misty grouper, queen snapper, and silk snapper. Action 2 would remove the ban on vessels transiting through the closure with prohibited species on board.

The Regulatory Impact Review for Amendment 17B (SAFMC 2010) estimated the adverse economic impact of the prohibition on fishing for, possession and retention of these six species in the closed area would be $348,076 annually (Table 4). Therefore, Action 1 would restore landings and associated ex-vessel revenue, yielding an average economic benefit of $346,076 annually, assuming the previous estimate is representative of average annual loss. If that figure

underestimates the cost of the prohibition, the economic benefit of Action 1 would be greater than $346,076 annually. Similarly, if that figure overestimates the cost of the prohibition, the annual economic benefit of Action 1 would be less than $346,076.

Table 4. 2007 Landings and Ex-Vessel Value of Six Species. Source: Amendment 17B (SAFMC 2010).

Species	Landings (Pounds Gutted Weight)	Ex-Vessel Value (Dollars)	Ave Price per Pound
Snowy Grouper	79,607	247,970	3.11
Blueline Tilefish	59,875	88,102	1.47
Yellowedge Grouper	2,162	7,202	3.33
Misty Grouper	0	0	NA
Queen Snapper	0	0	NA
Silk Snapper	1,781	4,802	2.70
TOTAL	143,425	348,076	2.43

Proposed Action 2 would maintain a prohibition on transit through the closed area with prohibited species onboard. However, because the proposed closure action is to eliminate the 240-foot (40-fathom) closed area, proposed Action 2 is not relevant and maintaining the transit prohibition would not be expected to result in any adverse economic impacts.

1.6 Substantial number of small entities criterion

It is assumed that the proposed rule would apply to all small businesses within the Finfish Fishing Industry and Charter Fishing Industry that are permitted to harvest snapper grouper species. However, only an unknown subset of these businesses would be expected to harvest deepwater species beyond a depth of 240 feet (40 fathoms; 73 m).

1.7 Significant economic impact criterion

The outcome of "significant economic impact" can be ascertained by examining two issues: disproportionality and profitability.

Disproportionality: Does the proposed rule place a substantial number of small entities at a significant competitive disadvantage to large entities?

Profitability: Does the proposed rule significantly reduce profit for a substantial number of small entities?

The proposed action would be expected to reduce the adverse economic impacts of Amendment 17B (SAFMC 2010). Therefore, this proposed rule would have a beneficial economic impact and not be expected to significantly reduce profit for a substantial number of small entities.

1.8 Description of significant alternatives

Because this proposed rule would be expected to have a beneficial economic impact and not be expected to significantly reduce profit for a substantial number of small entities, the issue of significant alternatives is not relevant.

1.9 References

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

Appendix F. Essential Fish Habitat and Move to Ecosystem Based Management

South Atlantic Fishery Management Council Habitat Conservation, Ecosystem Coordination and Collaboration

The Council, using the Essential Fish Habitat Plan as the cornerstone, adopted a strategy to facilitate the move to an ecosystem-based approach to fisheries management in the region. This approach required a greater understanding of the South Atlantic ecosystem and the complex relationships among humans, marine life and the environment including essential fish habitat. To accomplish this, a process was undertaken to facilitate the evolution of the Habitat Plan into a Fishery Ecosystem Plan (FEP), thereby providing more comprehensive understanding of the biological, social and economic impacts of management necessary to initiate the transition from single species management to ecosystem-based management in the region.

Moving to Ecosystem-Based Management

The Council adopted broad goals for Ecosystem-Based Management to include maintaining or improving ecosystem structure and function; maintain or improving economic, social and cultural benefits from resources; and maintaining or improving biological, economic and cultural diversity. Development of a regional FEP (SAFMC 2009a) provided an opportunity to expand scope of the original Council Habitat Plan and compile and review available habitat, biological, social, and economic fishery and resource information for fisheries in the South Atlantic ecosystem. The South Atlantic Council views habitat conservation at the core of the move to EBM in the region. Therefore, development of the FEP was a natural next step in the evolution and expands and significantly updates the SAFMC Habitat Plan (SAFMC 1998a) incorporating comprehensive details of all managed species (SAFMC, South Atlantic States, ASMFC, and NOAA Fisheries Highly Migratory Species and Protected Species) including their biology, food web dynamics, and economic and social characteristics of the fisheries and habitats essential to their survival. The FEP therefore serves as a source document presents more complete and detailed information describing the South Atlantic ecosystem and the impact of the fisheries on the environment. This FEP updates information on designated Essential Fish Habitat (EFH) and EFH-Habitat Areas of Particular Concern; expands descriptions of biology and status of managed species; presents information that will support ecosystem considerations for managed species; and describes the social and economic characteristics of the fisheries in the region. In addition, it expands the discussion and description of existing research programs and needs to identify biological, social, and economic research needed to fully address ecosystem-based management in the region. In is anticipated that the FEP will provide a greater degree of guidance by fishery, habitat, or major ecosystem consideration of bycatch reduction, prey-predator interactions, maintaining biodiversity, and spatial management needs. This FEP serves as a living source document of biological, economic, and social information for all Fishery Management Plans (FMP). Future Environmental Assessments and Environmental Impact Statements associated with subsequent amendments to Council FMPs will draw from or cite by reference the FEP.

The Fishery Ecosystem Plan for the South Atlantic Region encompasses the following volume structure:
FEP Volume I - Introduction and Overview of FEP for the South Atlantic Region
FEP Volume II - South Atlantic Habitats and Species
FEP Volume III - South Atlantic Human and Institutional Environment
FEP Volume IV - Threats to South Atlantic Ecosystem and Recommendations

FEP Volume V - South Atlantic Research Programs and Data Needs
FEP Volume VI - References and Appendices

Comprehensive Ecosystem-Based Amendment (CE-BA) 1 (SAFMC 2009b) is supported by this FEP and updates EFH and EFH-HAPC information and addresses the Final EFH Rule (e.g., GIS presented for all EFH and EFH-HAPCs). Management actions implemented in the CE-BA establish deepwater Coral HAPCs to protect what is thought to be the largest continuous distribution (>23,000 square miles) of pristine, deepwater coral ecosystems in the world.

Ecosystem Approach to Deepwater Ecosystem Management

The South Atlantic Council manages coral, coral reefs and live/hard bottom habitat, including deepwater corals, through the Fishery Management Plan for Coral, Coral Reefs and Live/Hard Bottom Habitat of the South Atlantic Region (Coral FMP). Mechanisms exist in the FMP, as amended, to further protect deepwater coral and live/hard bottom habitats. The SAFMC's Habitat and Environmental Protection Advisory Panel and Coral Advisory Panel have supported proactive efforts to identify and protect deepwater coral ecosystems in the South Atlantic region. Management actions in Comprehensive Ecosystem-Based Amendment (CE-BA 1) (SAFMC 2009b)established deepwater coral HAPCs (C-HAPCs) to protect what is thought to be the largest continuous distribution (>23,000 square miles) of pristine deepwater coral ecosystems in the world. In addition, CE-BA 1 established areas within the CHAPC which provide for traditional fishing in limited areas which do not impact deepwater coral habitat. CE-BA 1, supported by the FEP, also addresses non-regulatory updates for existing EFH and EFH- HAPC information and addresses the spatial requirements of the Final EFH Rule (i.e., GIS presented for all EFH and EFH-HAPCs).

Building from a Habitat to an Ecosystem Network to Support the Evolution

Starting with our Habitat and Environmental Protection Advisory Panel, the Council expanded and fostered a comprehensive Habitat network in our region to develop the Habitat Plan of the South Atlantic Region completed in 1998 to support the EFH rule. Building on the core regional collaborations, the Council facilitated an expansion to a Habitat and Ecosystem network to support the development of the FEP and CE-BA as well as coordinate with partners on other regional efforts.

These efforts include participation as a member and on the Board of the Southeast Coastal Regional Ocean Observing Association (SECOORA) to guide and direct priority needs for observation and modeling to support fisheries oceanography and integration into stock assessment process through SEDAR. Cooperation through SECOORA is envisioned to facilitate the following:

- Refining current or water column designations of EFH and EFH-HAPCs (e.g., Gulf Stream and Florida Current)
- Providing oceanographic models linking benthic, pelagic habitats and food webs
- Providing oceanographic input parameters for ecosystem models
- Integration of OOS information into Fish Stock Assessment process in the SA region
- Facilitating OOS system collection of fish and fishery data and other research necessary to support the Council's use of area-based management tools in the SA Region including but not limited to EFH, EFH-HAPCs, Marine Protected Areas, Deepwater Coral Habitat Areas of Particular Concern, Special Management Zones and Allowable Gear Areas.
- Integration of OOS program capabilities and research Needs into the South Atlantic Fishery Ecosystem Plan

- Collaboration with SECOORA to integrate OOS products on the Council's Habitat and Ecosystem Internet Mapping System to facilitate model and tool development
- Expanding IMS and Arc Services will provide permissioned researchers access to data or products including those collected/developed by SA OOS partners

In addition, the Council serves on the National Habitat Board and, as a member of the Southeast Aquatic Resource Partnership (SARP), has highlighted the collaboration by including the Southeast Aquatic Habitat Plan and associated watershed conservation restoration targets into the FEP. Many of the habitat, water quality, and water quantity conservation needs identified in the threats and recommendations Volume of the FEP are directly addressed by on-the-ground projects supported by SARP. This cooperation results in funding fish habitat restoration and conservation intended to increase the viability of fish populations and fishing opportunity which also meets the needs to conserve and manage Essential Fish Habitat for Council managed species or habitat important to their prey.

Initially discussed as a South Atlantic Eco-regional Compact, the Council has also cooperated with South Atlantic States in the formation of a Governor's South Atlantic Alliance (SAA). This will also provide regional guidance and resources that will address State and Council broader habitat and ecosystem conservation goals. The SAA was initiated in 2006. An Executive Planning Team (EPT), by the end of 2007, had created a framework for the Governors South Atlantic Alliance. The formal agreement between the four states (NC, SC, GA, and FL) was executed in May 2009. The Agreement specifies that the Alliance will prepare a "Governors South Atlantic Alliance Action Plan" which will be reviewed annually for progress and updated every five years for relevance of content. Alliance mission and purpose is to promote collaboration among the four states, and with the support and interaction of federal agencies, academe, regional organizations, non-governmental organizations, and the private sector, to sustain and enhance the region's coastal and marine resources. The Alliance proposes to regionally implement science-based actions and policies that balance coastal and marine ecosystems capacities to support both human and natural systems. An Action Plan was approved by the Governors and an Implementation Plan is under development.

One of the more recent collaborations is the Council participation as Steering Committee member for the newly establish South Atlantic Landscape Conservation Cooperative (SALCC). Landscape Conservation Cooperatives (LCCs) are applied conservation science partnerships focused on a defined geographic area that informs on-the-ground strategic conservation efforts at landscape scales. LCC partners include DOI agencies, other federal agencies, states, tribes, non-governmental organizations, universities and others. The newly formed Department of Interior Southeast Climate Services Center (CSC) has the LCCs in the region as their primary clients. One of the initial charges of the CSCs is to downscale climate models for use at finer scales.

Building Tools to support EBM in the South Atlantic Region

The Council has developed a Habitat and Ecosystem Section of the website http://www.safmc.net/ecosystem/Home/EcosystemHome/tabid/435/Default.aspx and, in cooperation with the Florida Wildlife Research Institute (FWRI), developed a Habitat and Ecosystem Internet Map Server (IMS) http://www.safmc.net/EcosystemManagement/EcosystemBoundaries/MappingandGISData/tabid/62/Default.aspx. The IMS was developed to support Council and regional partners' efforts in the transition to EBM. Other regional partners include NMFS Habitat Conservation, South Atlantic States,

local management authorities, other Federal partners, universities, conservation organizations, and recreational and commercial fishermen. As technology and spatial information needs evolve, the distribution and use of GIS demands greater capabilities. The Council has continued its collaboration with FWRI in the now evolution to Web Services initially for for Essential Fish Habitat (http://ocean.floridamarine.org/SAFMC_EFH/) and Fishery Regulations (http://ocean.floridamarine.org/SAFMC_Regulations/) and is refining permissioned services for Fishery Independent and Habitat Research and developing one for Ocean Energy activities in the region (e.g., wind, wave and current).

Ecosystem Based Action, Future Challenges and Needs

The Council has implemented ecosystem-based principles through several existing fishery management actions including establishment of deepwater Marine Protected Areas for the Snapper Grouper fishery, proactive harvest control rules on species (e.g., dolphin and wahoo) which are not overfished, implementing extensive gear area closures which in most cases eliminate the impact of fishing gear on Essential Fish Habitat and use of other spatial management including Special Management Zones. Pursuant to the development of the Comprehensive Ecosystem-Based Amendment, the Council is taking an ecosystem approach to protect deepwater ecosystems while providing for traditional fisheries for the Golden Crab and Royal Red shrimp in areas where they do not impact deepwater coral habitat. The stakeholder based process taps in on an extensive regional Habitat and Ecosystem network. Support tools facilitate Council deliberations and with the help of regional partners, are being refined to address long-term ecosystem management needs.

One of the greatest challenges to the long-term move to EBM in the region is funding high priority research, including but not limited to, comprehensive benthic mapping and ecosystem model and management tool development. In addition, collecting detailed information on fishing fleet dynamics including defining fishing operation areas by species, species complex and season, as well as catch relative to habitat is critical for assessment of fishery, community, and habitat impacts and for Council use of place based management measures. Additional resources need to be dedicated to expand regional coordination of modeling, mapping, characterization of species use of habitats, and full funding of regional fishery independent surveys (e.g., MARMAP, SEAMAP and SEFIS) which are linking directly to addressing high priority management needs. Development of ecosystem information systems to support Council management should build on existing tools (e.g., Regional Habitat and Ecosystem GIS and Arc Services) and provide resources to regional cooperating partners for expansion to address long-term Council needs.

The FEP and CE-BA 1 complement, but do not replace, existing FMPs. In addition, the FEP serves as source document to the CE-BAs. NOAA should support and build on regional coordination efforts of the Council as it transitions to a broader management approach. Resources need to be provided to collect information necessary to update and refine our FEP and support future fishery actions including but not limited to completing one of the highest priority needs to support EBM, the completion of mapping of near-shore, mid-shelf, shelf edge and deepwater habitats in the South Atlantic region. In developing future FEPs, the Council will draw on SAFEs (Stock Assessment and Fishery Evaluation reports) which NMFS is required to provide the Council for all FMPs implemented under the Magnuson-Stevens Act. The FEP, serving as the source document for CE-BAs, could also meet NMFS SAFE requirements if information is provided to the Council to update necessary sections.

EFH and EFH-HAPC Designations Translated to Cooperative Habitat Policy Development and Protection The Council actively comments on non-fishing projects or policies that may impact fish habitat. Appendix A of the Comprehensive Amendment Addressing Essential Fish Habitat in Fishery Management Plans of the South Atlantic Region (SAFMC 1998b) outlines the Council's comment and policy development process and the establishment of a four-state Habitat Advisory Panel. Members of the Habitat Advisory Panel serve as the Council's habitat contacts and professionals in the field. AP members bring projects to the Council's attention, draft comment letters, and attend public meetings. With guidance from the Advisory Panel, the Council has developed and approved policies on:

1. Energy exploration, development, transportation and hydropower re-licensing;
2. Beach dredging and filling and large-scale coastal engineering;
3. Protection and enhancement of submerged aquatic vegetation;
4. Alterations to riverine, estuarine and nearshore flows; and
5. Marine aquaculture.
6. Marine Ecosystems and Non-Native and Invasive Species
7. Estuarine Ecosystems and Non-Native and Invasive Species

NOAA Fisheries, State and other Federal agencies apply EFH and EFH-HAPC designations and protection policies in the day-to-day permit review process. In addition to the workshop process described above the revision and updating of existing habitat policies and the development of new policies is being coordinated with core agency representatives on the Habitat and Coral Advisory Panels. Existing policies are included at the end of this Appendix.

South Atlantic Bight Ecopath Model

The Council worked cooperatively the University of British Columbia and the Sea Around Us project to develop a straw-man and preliminary food web models (Ecopath with Ecosim) to characterize the ecological relationships of South Atlantic species, including those managed by the Council. This effort was envisioned to help the Council and cooperators in identifying available information and data gaps while providing insight into ecosystem function. More importantly, the model development process provides a vehicle to identify research necessary to better define populations, fisheries and their interrelationships. While individual efforts are still underway in the South Atlantic (e.g., Biscayne Bay) only with significant investment of new resources through other programs will a comprehensive regional model be further developed.

Essential Fish Habitat and Essential Fish Habitat Areas of Particular Concern

Following is a summary of the current South Atlantic Council's EFH and EFH-HAPCs. Information supporting their designation is being updated (pursuant to the EFH Final Rule) in the Council's Fishery Ecosystem Plan and Comprehensive Ecosystem Amendment:

Snapper Grouper FMP

Essential fish habitat for snapper-grouper species 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 600 feet (but to at least 2000 feet for wreckfish) where the annual water temperature range is sufficiently warm to maintain adult populations of members of this largely tropical complex. EFH includes the spawning area in the water column above the adult habitat and the additional pelagic environment, including *Sargassum*, required for

larval survival and growth up to and including settlement. In addition the Gulf Stream is an essential fish habitat because it provides a mechanism to disperse snapper grouper larvae.

For specific life stages of estuarine dependent and nearshore snapper-grouper species, essential fish habitat includes areas inshore of the 100-foot 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.

Areas which meet the criteria for 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; nearshore hard bottom areas; The Point, The Ten Fathom Ledge, and Big Rock (North Carolina); The Charleston Bump (South Carolina); mangrove habitat; seagrass habitat; oyster/shell habitat; all coastal inlets; all state-designated nursery habitats of particular importance to snapper grouper (e.g., Primary and Secondary Nursery Areas designated in North Carolina); pelagic and benthic *Sargassum*; Hoyt Hills for wreckfish; the *Oculina* Bank Habitat Area of Particular Concern; all hermatypic coral habitats and reefs; manganese outcroppings on the Blake Plateau; and Council-designated Artificial Reef Special Management Zones (SMZs). In addition, the Council through CEBA 2 (SAFMC 2011) is proposing the deepwater snapper grouper MPAs and golden tilefish and blueline tilefish habitat as EFH-HAPCs under the Snapper Grouper FMP as follows:

EFH-HAPCs for golden tilefish to include irregular bottom comprised of troughs and terraces inter-mingled with sand, mud, or shell hash bottom. Mud-clay bottoms in depths of 150-300 meters are HAPC. Golden tilefish are generally found in 80-540 meters, but most commonly found in 200-meter depths.

EFH-HAPC for blueline tilefish to include irregular bottom habitats along the shelf edge in 45-65 meters depth; shelf break; or upper slope along the 100-fathom contour (150-225 meters); hardbottom habitats characterized as rock overhangs, rock outcrops, manganese-phosphorite rock slab formations, or rocky reefs in the South Atlantic Bight; and the Georgetown Hole (Charleston Lumps) off Georgetown, SC.

EFH-HAPCs for the snapper grouper complex to include the following deepwater Marine Protected Areas (MPAs) as designated in Snapper Grouper Amendment 14; Snowy Grouper Wreck MPA, Northern South Carolina MPA, Edisto MPA, Charleston Deep Artificial Reef MPA, Georgia MPA, North Florida MPA, St. Lucie Hump MPA and East Hump MPA.

Shrimp FMP

For penaeid shrimp, Essential Fish Habitat includes inshore estuarine nursery areas, offshore marine habitats used for spawning and growth to maturity, and all interconnecting water bodies as described in the Habitat Plan. Inshore nursery areas include tidal freshwater (palustrine), estuarine, and marine emergent wetlands (e.g., intertidal marshes); tidal palustrine forested areas; mangroves; tidal freshwater,

estuarine, and marine submerged aquatic vegetation (e.g., seagrass); and subtidal and intertidal non-vegetated flats. This applies from North Carolina through the Florida Keys.

For rock shrimp, essential fish habitat consists of offshore terrigenous and biogenic sand bottom habitats from 18 to 182 meters in depth with highest concentrations occurring between 34 and 55 meters. This applies for all areas from North Carolina through the Florida Keys. Essential fish habitat includes the shelf current systems near Cape Canaveral, Florida which provide major transport mechanisms affecting planktonic larval rock shrimp. These currents keep larvae on the Florida Shelf and may transport them inshore in spring. In addition the Gulf Stream is an essential fish habitat because it provides a mechanism to disperse rock shrimp larvae.

Essential fish habitat for royal red shrimp include the upper regions of the continental slope from 180 meters (590 feet) to about 730 meters (2,395 feet), with concentrations found at depths of between 250 meters (820 feet) and 475 meters (1,558 feet) over blue/black mud, sand, muddy sand, or white calcareous mud. In addition the Gulf Stream is an essential fish habitat because it provides a mechanism to disperse royal red shrimp larvae.

Areas which meet the criteria for EFH-HAPCs for penaeid shrimp include all coastal inlets, all state-designated nursery habitats of particular importance to shrimp (for example, in North Carolina this would include all Primary Nursery Areas and all Secondary Nursery Areas), and state-identified overwintering areas.

Coastal Migratory Pelagics FMP

Essential fish habitat for coastal migratory pelagic species includes sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters, from the surf to the shelf break zone, but from the Gulf stream shoreward, including *Sargassum*. In addition, all coastal inlets, all state-designated nursery habitats of particular importance to coastal migratory pelagics (for example, in North Carolina this would include all Primary Nursery Areas and all Secondary Nursery Areas).

For Cobia essential fish habitat also includes high salinity bays, estuaries, and seagrass habitat. In addition, the Gulf Stream is an essential fish habitat because it provides a mechanism to disperse coastal migratory pelagic larvae.
For king and Spanish mackerel and cobia essential fish habitat occurs in the South Atlantic and Mid-Atlantic Bights.

Areas which meet the criteria for EFH-HAPCs include sandy shoals of Capes Lookout, Cape Fear, and Cape Hatteras from shore to the ends of the respective shoals, but shoreward of the Gulf stream; The Point, The Ten-Fathom Ledge, and Big Rock (North Carolina); The Charleston Bump and Hurl Rocks (South Carolina); The Point off Jupiter Inlet (Florida); *Phragmatopoma* (worm reefs) reefs off the central east coast of Florida; nearshore hard bottom south of Cape Canaveral; The Hump off Islamorada, Florida; The Marathon Hump off Marathon, Florida; The “Wall” off of the Florida Keys; Pelagic *Sargassum*; and Atlantic coast estuaries with high numbers of Spanish mackerel and cobia based on abundance data from the ELMR Program. Estuaries meeting this criteria for Spanish mackerel include Bogue Sound and New River, North Carolina; Bogue Sound,

North Carolina (Adults May-September salinity >30 ppt); and New River, North Carolina (Adults May-October salinity >30 ppt). For Cobia they include Broad River, South Carolina; and Broad River, South Carolina (Adults & juveniles May-July salinity >25ppt).

Golden Crab FMP

Essential fish habitat for golden crab includes the U.S. Continental Shelf from Chesapeake Bay south through the Florida Straits (and into the Gulf of Mexico). In addition, the Gulf Stream is an essential fish habitat because it provides a mechanism to disperse golden crab larvae. The detailed description of seven essential fish habitat types (a flat foraminferan ooze habitat; distinct mounds, primarily of dead coral; ripple habitat; dunes; black pebble habitat; low outcrop; and soft-bioturbated habitat) for golden crab is provided in Wenner et al. (1987). There is insufficient knowledge of the biology of golden crabs to identify spawning and nursery areas and to identify HAPCs at this time. As information becomes available, the Council will evaluate such data and identify HAPCs as appropriate through the framework

Spiny Lobster FMP

Essential fish habitat for spiny lobster includes nearshore shelf/oceanic waters; shallow subtidal bottom; seagrass habitat; unconsolidated bottom (soft sediments); coral and live/hard bottom habitat; sponges; algal communities (*Laurencia*); and mangrove habitat (prop roots). In addition the Gulf Stream is an essential fish habitat because it provides a mechanism to disperse spiny lobster larvae.

Areas which meet the criteria for EFH-HAPCs for spiny lobster include Florida Bay, Biscayne Bay, Card Sound, and coral/hard bottom habitat from Jupiter Inlet, Florida through the Dry Tortugas, Florida.

Coral, Coral Reefs, and Live/Hard Bottom Habitats FMP

Essential fish habitat for corals (stony corals, octocorals, and black corals) must incorporate habitat for over 200 species. EFH for corals include the following:

A. Essential fish habitat for hermatypic stony corals includes rough, hard, exposed, stable substrate from Palm Beach County south through the Florida reef tract in subtidal to 30 m depth, subtropical (15°-35° C), oligotrophic waters with high (30-35$^{o}/_{oo}$) salinity and turbidity levels sufficiently low enough to provide algal symbionts adequate sunlight penetration for photosynthesis. Ahermatypic stony corals are not light restricted and their essential fish habitat includes defined hard substrate in subtidal to outer shelf depths throughout the management area.

B. Essential fish habitat for *Antipatharia* (black corals) includes rough, hard, exposed, stable substrate, offshore in high (30-35$^{o}/_{oo}$) salinity waters in depths exceeding 18 meters (54 feet), not restricted by light penetration on the outer shelf throughout the management area.

C. Essential fish habitat for octocorals excepting the order Pennatulacea (sea pens and sea pansies) includes rough, hard, exposed, stable substrate in subtidal to outer shelf depths within a wide range of salinity and light penetration throughout the management area.

D. Essential fish habitat for Pennatulacea (sea pens and sea pansies) includes muddy, silty bottoms in subtidal to outer shelf depths within a wide range of salinity and light penetration.

Areas which meet the criteria for EFH-HAPCs for coral, coral reefs, and live/hard bottom include: The 10-Fathom Ledge, Big Rock, and The Point (North Carolina); Hurl Rocks and The Charleston Bump (South Carolina); Gray's Reef National Marine Sanctuary (Georgia); The *Phragmatopoma* (worm reefs) reefs off the central east coast of Florida; Oculina Banks off the east coast of Florida from Ft. Pierce to Cape Canaveral; nearshore (0-4 meters; 0-12 feet) hard bottom off the east coast of Florida from Cape Canaveral to Broward County); offshore (5-30 meter; 15-90 feet) hard bottom off the east coast of Florida from Palm Beach County to Fowey Rocks; Biscayne Bay, Florida; Biscayne National Park, Florida; and the Florida Keys National Marine Sanctuary. In addition, the Council through CEBA 2 (SAFMC 2011) is proposing the Deepwater Coral HAPCs as EFH-HAPCs under the Coral FMP as follows:

Deepwater Coral HAPCs designated in Comprehensive Ecosystem-Based Amendment 1 as Snapper Grouper EFH-HAPCs: Cape Lookout Coral HAPC, Cape Fear Coral HAPC, Blake Ridge Diapir Coral HAPC, Stetson-Miami Terrace Coral HAPC, Pourtalés Terrace Coral HAPC.

Dolphin and Wahoo FMP

EFH for dolphin and wahoo is the Gulf Stream, Charleston Gyre, Florida Current, and pelagic *Sargassum*. This EFH definition for dolphin was approved by the Secretary of Commerce on June 3, 1999 as a part of the South Atlantic Council's Comprehensive Habitat Amendment (SAFMC, 1998b) (dolphin was included within the Coastal Migratory Pelagics FMP).

Areas which meet the criteria for EFH-HAPCs for dolphin and wahoo in the Atlantic include The Point, The Ten-Fathom Ledge, and Big Rock (North Carolina); The Charleston Bump and The Georgetown Hole (South Carolina); The Point off Jupiter Inlet (Florida); The Hump off Islamorada, Florida; The Marathon Hump off Marathon, Florida; The "Wall" off of the Florida Keys; and Pelagic *Sargassum*. This EFH-HAPC definition for dolphin was approved by the Secretary of Commerce on June 3, 1999 as a part of the South Atlantic Council's Comprehensive Habitat Amendment (dolphin was included within the Coastal Migratory Pelagics FMP).

Pelagic *Sargassum* Habitat FMP

The Council through CEBA 2 (SAFMC 2011) is proposing to designate the top 10 meters of the water column in the South Atlantic EEZ bounded by the Gulfstream, as EFH for pelagic Sargassum.

Actions Implemented That Protect EFH and EFH-HAPCs

Snapper Grouper FMP

- Prohibited the use of the following gears to protect habitat: bottom longlines in the EEZ inside of 50 fathoms or anywhere south of St. Lucie Inlet Florida, fish traps, bottom tending (roller-rig) trawls on live bottom habitat, and entanglement gear.

- Established the *Oculina* Experimental Closed Area where the harvest or possession of all species in the snapper grouper complex is prohibited

Shrimp FMP

- Prohibition of rock shrimp trawling in a designated area around the *Oculina* Bank,
- Mandatory use of bycatch reduction devices in the penaeid shrimp fishery,
- Mandatory Vessel Monitoring System (VMS) in the Rock Shrimp Fishery.
- A mechanism that provides for the concurrent closure of the EEZ to penaeid shrimping if environmental conditions in state waters are such that the overwintering spawning stock is severely depleted.

Pelagic Sargassum Habitat FMP

- Prohibited all harvest and possession of *Sargassum* from the South Atlantic EEZ south of the latitude line representing the North Carolina/South Carolina border (34° North Latitude).
- Prohibited all harvest of *Sargassum* from the South Atlantic EEZ within 100 miles of shore between the 34° North Latitude line and the Latitude line representing the North Carolina/Virginia border.
- Harvest of *Sargassum* from the South Atlantic EEZ is limited to the months of November through June.
- Established an annual Total Allowable Catch (TAC) of 5,000 pounds landed wet weight.
- Required that an official observer be present on each *Sargassum* harvesting trip. Require that nets used to harvest *Sargassum* be constructed of four inch stretch mesh or larger fitted to a frame no larger than 4 feet by 6 feet.

Coastal Migratory Pelagics FMP

- Prohibited of the use of drift gill nets in the coastal migratory pelagic fishery;

Golden Crab FMP

- In the northern zone golden crab traps can only be deployed in waters deeper than 900 feet; in the middle and southern zones traps can only be deployed in waters deeper than 700 feet.
  Northern zone - north of the 28°N. latitude to the North Carolina/Virginia border;
  Middle zone - 28°N. latitude to 25°N. latitude; and
  Southern zone - south of 25°N. latitude to the border between the South Atlantic and Gulf of Mexico Fishery Management Councils.

Coral, Coral Reefs and Live/Hard Bottom FMP

- Established an optimum yield of zero and prohibiting all harvest or possession of these resources which serve as essential fish habitat to many managed species.
- Designated of the *Oculina* Bank Habitat Area of Particular Concern
- Expanded the *Oculina* Bank Habitat Area of Particular Concern (HAPC) to an area bounded to the west by 80°W. longitude, to the north by 28°30' N. latitude, to the south by 27°30' N. latitude, and to the east by the 100 fathom (600 feet) depth contour.
- Established the following two Satellite *Oculina* HAPCs: (1) Satellite *Oculina*

HAPC #1 is bounded on the north by 28°30'N. latitude, on the south by 28°29'N. latitude, on the east by 80°W. longitude, and on the west by 80°3'W. longitude, and (2) Satellite *Oculina* HAPC #2 is bounded on the north by 28°17'N. latitude, on the south by 28°16'N. latitude, on the east by 80°W. longitude, and on the west by 80°3'W. longitude.

- Prohibited the use of all bottom tending fishing gear and fishing vessels from anchoring or using grapples in the *Oculina* Bank HAPC.
- Established a framework procedure to modify or establish Coral HAPCs.
- Established the following six deepwater CHAPCs: Cape Lookout Lophelia Banks, Cape Fear Lophelia Banks, Stetson Reefs, Savannah and East Florida Lithoherms, and Miami Terrace (Stetson-Miami Terrace), Pourtales Terrace, and Blake Ridge Diapir Methane Seep.
- Within the deepwater CHAPCs, the possession of coral species and the use of all bottom damaging gear is prohibited including bottom longline, trawl (bottom and mid-water), dredge, pot or trap, or the use of an anchor, anchor and chain, or grapple and chain by all fishing vessels.

South Atlantic Council Policies for Protection and Restoration of Essential Fish Habitat.

SAFMC Habitat and Environmental Protection Policy

In recognizing that species are dependent on the quantity and quality of their essential habitats, it is the policy of the SAFMC to protect, restore, and develop habitats upon which fisheries species depend; to increase the extent of their distribution and abundance; and to improve their productive capacity for the benefit of present and future generations. For purposes of this policy, "habitat" is defined as the physical, chemical, and biological parameters that are necessary for continued productivity of the species that is being managed. The objectives of the SAFMC policy will be accomplished through the recommendation of no net loss or significant environmental degradation of existing habitat. A long-term objective is to support and promote a net-gain of fisheries habitat through the restoration and rehabilitation of the productive capacity of habitats that have been degraded, and the creation and development of productive habitats where increased fishery production is probable. The SAFMC will pursue these goals at state, Federal, and local levels. The Council shall assume an aggressive role in the protection and enhancement of habitats important to fishery species, and shall actively enter Federal, decision- making processes where proposed actions may otherwise compromise the productivity of fishery resources of concern to the Council.

SAFMC EFH Policy Statements

In addition to implementing regulations to protect habitat from fishing related degradation, the Council in cooperation with NOAA Fisheries, actively comments on non-fishing projects or policies that may impact fish habitat. The Council adopted a habitat policy and procedure document that established a four-state Habitat Advisory Panel and adopted a comment and policy development process. Members of the Habitat Advisory Panel serve as the Council's habitat contacts and professionals in the field. With guidance from the Advisory Panel, the Council has developed and approved the following habitat policy statements which are available on the Habitat and Ecosystem section of the Council website:

Protection and Restoration of EFH from Marine Aquaculture
http://www.safmc.net/Portals/0/HabitatPolicies/SAFMCAquaPolicyFinalJune07.pdf
Protection and Enhancement of Marine Submerged Aquatic Vegetation
http://www.safmc.net/Portals/0/HabitatPolicies/SAFMCSAVPol.pdf
Protection and Restoration of EFH from Beach Dredging and Filling

http://www.safmc.net/Portals/0/HabitatPolicies/BeachPolicy.pdf
Protection and Restoration of EFH from Energy Exploration, Development, Transportation and Hydropower Re-Licensing
http://www.safmc.net/Portals/0/HabitatPolicies/SAFMCEnergyPolicyFinal05.pdf
Protection and Restoration of EFH from Alterations to Riverine, Estuarine and Nearshore Flows
http://www.safmc.net/Portals/0/HabitatPolicies/FlowsPolicy.pdf
Policies for the Protection of South Atlantic Estuarine Ecosystems from Non-Native and Invasive Species
http://www.safmc.net/LinkClick.aspx?fileticket=Qn%2baT%2blNjZM%3d&tabid=245
Policies for the Protection of South Atlantic Marine Ecosystems from No-Native and Invasive Species
http://www.safmc.net/LinkClick.aspx?fileticket=bNFKO%2fIcvHQ%3d&tabid=245

Appendix G. Environmental Justice Considerations

Executive Order 12898 requires federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. This executive order is generally referred to as environmental justice (EJ).

To evaluate EJ considerations for the proposed action, information on poverty and minority rates is examined at the county level. Information on the race and income status for groups at the different participation levels (vessel owners, crew, dealers, processors, employees, employees of associated support industries, etc.) is not available. Because this proposed action would be expected to affect fishermen and associated industries in numerous communities along the South Atlantic coast and not just those profiled, it is possible that other counties or communities have poverty or minority rates that exceed the EJ thresholds.

In order to identify the potential for EJ concern, the rates of minority populations (non-white, including Hispanic) and the percentage of the population that was below the poverty line were examined. The threshold for comparison that was used was 1.2 times the state average such that, if the value for the community or county was greater than or equal to 1.2 times the state average, then the community or county was considered an area of potential EJ concern. Census data for the year 2000 was used Estimates of the state minority and poverty rates, associated thresholds, and community rates are provided in **Table 1**.

Among the communities examined, based on available demographic information, only the poverty rates for Daytona Beach and St. Augustine, Florida suggest potential EJ concern. As noted above, however, additional communities beyond those profiled would be expected to be affected by the actions in this proposed amendment. Because these communities have not been profiled, the absence of additional potential EJ concerns cannot be assumed and the total number of communities that exceed the thresholds is unknown.

However, while some communities expected to be affected by this proposed amendment may have minority or economic profiles that exceed the EJ thresholds and, therefore, may constitute areas of concern, significant EJ issues are not expected to arise as a result of this proposed amendment. No adverse human health or environmental impacts are expected to accrue to this proposed amendment, nor are these measures expected to result in increased risk or exposure of affected individuals to adverse health hazards. The actions in this proposed amendment are expected to incur social and economic benefits to users and communities by removing the spatial closure implemented in Amendment 17B.

The proposed management measures would apply to all participants in the affected area, regardless of minority status or income level, and information is not available to suggest that minorities or lower income persons are, on average, more dependent on the affected species than non-minority or higher income persons. The proposed actions will remove a spatial closure, which was established to protect warsaw grouper and speckled hind. The proposed actions are expected to reduce economic impacts on fishermen who fish within the areas included in the

spatial closure for species other than warsaw grouper and speckled hind, particularly snowy grouper and blueline tilefish. The proposed actions may result in allowing lower income fishermen who would be most vulnerable to reductions in fishing income continue to fish and will reduce potential EJ concerns that may have resulted from implementation of the closed area in Amendment 17B.

Finally, the general participatory process used in the development of fishery management measures is expected to provide sufficient opportunity for meaningful involvement by potentially affected individuals to participate in the development process of this amendment and have their concerns factored into the decision process.

Table 1. Environmental Justice Thresholds (2000 U.S. Census data).

State	Community	Minority Rate	Minority Threshold*	Poverty Rate	Poverty Threshold*
Florida		34.60	41.52	12.50	15.00
	Cape Canaveral	8.10		11.60	
	Daytona Beach	39.7		23.6	
	Fernandina Beach	20.0		10.2	
	Jacksonville Beach	11.0		7.2	
	St. Augustine	20.7		15.8	
Georgia		37.40	44.88	13.00	15.60
	Townsend**	39.10		14.60	
South Carolina		33.90	40.68	14.10	16.92
	Little River	9.10		7.50	
North Carolina		29.80	35.76	12.30	14.76
	Atlantic City	2.60		7.30	
	Beaufort	25.40		16.60	
	Hatteras Village	6.60		10.00	
	Morehead City	19.20		14.60	
	Sneads Ferry	9.70		13.50	
	Wanchese	3.30		8.10	

*Calculated as 1.2 times the state rate.

**Values are for entire McIntosh County.