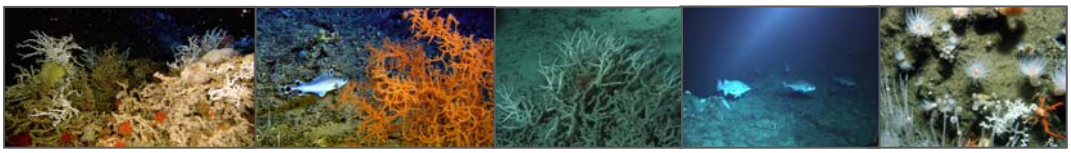
COMPREHENSIVE ECOSYSTEM-BASED AMENDMENT 2 FOR THE SOUTH ATLANTIC REGION



AMENDMENT 7 TO THE FISHERY MANAGEMENT PLAN FOR CORAL, CORAL REEFS, AND LIVE/HARDBOTTOM HABITATS OF THE SOUTH ATLANTIC REGION
AMENDMENT 23 TO THE FISHERY MANAGEMENT PLAN FOR THE SNAPPER GROUPER FISHERY OF THE SOUTH ATLANTIC REGION
AMENDMENT 21 TO THE FISHERY MANAGEMENT PLAN FOR THE COASTAL MIGRATORY PELAGIC RESOURCES IN THE ATLANTIC AND GULF OF MEXICO
AMENDMENT 1 TO THE FISHERY MANAGEMENT PLAN FOR PELAGIC *SARGASSUM* HABITAT OF THE SOUTH ATLANTIC REGION

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ABBREVIATIONS AND ACRONYMS

ABC	Acceptable Biological Catch
ACL	Annual Catch Limit
ACCSP	Atlantic Coastal Cooperative Statistics Program
AM	Accountability Measure
APA	Administrative Procedures Act
AUV	Autonomous Underwater Vehicle
B	A measure of stock biomass either in weight or other appropriate unit
B_{MSY}	The stock biomass expected to exist under equilibrium conditions when fishing at F_{MSY}
B_{OY}	The stock biomass expected to exist under equilibrium conditions when fishing at F_{OY}
B_{CURR}	The current stock biomass
CEA	Cumulative Effects Analysis
CEQ	Council on Environmental Quality
CFMC	Caribbean Fishery Management Council
CPUE	Catch per unit effort
CRP	Cooperative Research Program
CZMA	Coastal Zone Management Act
DEIS	Draft Environmental Impact Statement
EA	Environmental Assessment
EBM	Ecosystem-Based Management
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EFH-HAPC	Essential Fish Habitat - Habitat Area of Particular Concern
EIS	Environmental Impact Statement
EPAP	Ecosystem Principles Advisory Panel
ESA	Endangered Species Act of 1973
F	A measure of the instantaneous rate of fishing mortality
$F_{30\%SPR}$	Fishing mortality that will produce a static SPR = 30%
$F_{45\%SPR}$	Fishing mortality that will produce a static SPR = 45%
F_{CURR}	The current instantaneous rate of fishing mortality
FMP	Fishery Management Plan
F_{MSY}	The rate of fishing mortality expected to achieve MSY under equilibrium conditions and a corresponding biomass of B_{MSY}
F_{OY}	The rate of fishing mortality expected to achieve OY under equilibrium conditions and a corresponding biomass of B_{OY}
FEIS	Final Environmental Impact Statement
FMU	Fishery Management Unit
FONSI	Finding Of No Significant Impact
GFMC	Gulf of Mexico Fishery Management Council
GIS	Geographic Information System
IFQ	Individual Fishing Quota
IMS	Internet Mapping Server
M	Natural mortality rate

MARMAP	Marine Resources Monitoring Assessment and Prediction Program
MARFIN	Marine Fisheries Initiative
MBTA	Migratory Bird Treaty Act
MFMT	Maximum Fishing Mortality Threshold
MMPA	Marine Mammal Protection Act of 1973
MRFSS	Marine Recreational Fisheries Statistics Survey
MSA	Magnuson-Stevens Act
MSST	Minimum Stock Size Threshold
MSY	Maximum Sustainable Yield
NEPA	National Environmental Policy Act of 1969
NMFS	National Marine Fisheries Service
NMSA	National Marine Sanctuary Act
NOAA	National Oceanic and Atmospheric Administration
NRC	National Research Council
OFL	Overfishing Level
OY	Optimum Yield
POC	Pew Oceans Commission
R	Recruitment
RFA	Regulatory Flexibility Act
RIR	Regulatory Impact Review
SAFE	Stock Assessment and Fishery Evaluation Report
SAFMC	South Atlantic Fishery Management Council
SEDAR	Southeast Data, Assessment, and Review
SEFSC	Southeast Fisheries Science Center
SERO	Southeast Regional Office
SDDP	Supplementary Discard Data Program
SFA	Sustainable Fisheries Act
SIA	Social Impact Assessment
SSC	Scientific and Statistical Committee
TAC	Total allowable catch
T_{MIN}	The length of time in which a stock could rebuild to B_{MSY} in the absence of fishing mortality
USCG	U.S. Coast Guard
USCOP	U.S. Commission on Ocean Policy
VMS	Vessel Monitoring System

COMPREHENSIVE ECOSYSTEM-BASED AMENDMENT 2 FOR THE SOUTH ATLANTIC REGION

INCLUDING A DRAFT ENVIRONMENTAL ASSESSMENT AND DRAFT SOCIAL IMPACT ASSESSMENT/FISHERY IMPACT STATEMENT

Proposed actions:

- Modify management of octocorals in the South Atlantic
- Extend the South Atlantic Council's management unit for octocorals into the Gulf of Mexico Council's area of jurisdiction
- Modify the ACL for octocorals in the South Atlantic
- Modify management of SMZs off South Carolina
- Modify sea turtle release gear requirements for the snapper grouper fishery
- Amend the following FMPs to designate EFH and EFH-HAPCs: Snapper Grouper FMP; Coral FMP; *Sargassum* FMP

Lead agency:

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January 31st, 2011 (Jacksonville, FL)
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February 3rd, 2011 (Key Largo, FL)

ABSTRACT

This Comprehensive Ecosystem-Based Amendment 2 (CE-BA 2) consists of actions related to management of the octocoral fishery, modification of management of Special Management Zones (SMZs) off South Carolina, modification of sea turtle and smalltooth sawfish release gear requirements for the snapper grouper fishery and non-regulatory actions that designate new essential fish habitat (EFH) and EFH-habitat areas of particular concern (EFH-HAPCs). The South Atlantic Fishery Management Council (South Atlantic Council) developed the actions in the amendment consistent with the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act).

CE-BA 2 proposes to specify the annual catch limit (ACL) for octocorals in the South Atlantic region. The South Atlantic Council is considering modifying the fishery management unit (FMU) for octocorals under the Fishery Management Plan for Coral, Coral Reefs, Live/Hardbottom Habitats of the South Atlantic Region (Coral FMP) to specify that octocorals are included in the exclusive economic zone off of North Carolina, South Carolina, and Georgia. As a result of potentially reducing the management unit for octocorals, the South Atlantic Council is also considering an action to set the ACL at zero.

CE-BA 2 would amend the Snapper Grouper FMP and FMP for the Coastal Migratory Pelagic Resources in the Atlantic and Gulf of Mexico to require that harvest (with the use of all non-prohibited fishing gear) and possession of snapper grouper and coastal migratory pelagic managed species in the SMZs off South Carolina be limited to the recreational bag limit. This action responds to concern from fishermen about potential user conflicts in the SMZs off South Carolina.

An action to modify sea turtle and smalltooth sawfish release gear requirements for the snapper grouper fishery is also included in CE-BA 2. Fishermen have expressed concern that the current sea turtle and smalltooth sawfish handling and release gear requirements are intended for “heavier duty” gear used in longline fisheries and are unwieldy and less effective when used with the lighter tackle employed in the non-longline, hook-and-line component of the fishery.

This amendment would amend the South Atlantic Council FMPs as needed to designate new or modify existing EFH and EFH-HAPCs. CE-BA 2 would amend the FMP for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP) and the Coral FMP to designate additional EFH-HAPCs. To meet the Magnuson-Stevens Act requirement that all managed species have EFH designated, CE-BA 2 amends the FMP for Pelagic *Sargassum* Habitat FMP of the South Atlantic Region (*Sargassum* FMP) to designate EFH.

CE-BA 2 proposes actions that would:

- Modify management of octocorals in the South Atlantic

- Extend the South Atlantic Council's management unit for octocorals into the Gulf of Mexico Council's area of jurisdiction
- Modify the ACL for octocorals in the South Atlantic
- Modify management of SMZs off South Carolina
- Modify sea turtle release gear requirements for the snapper grouper fishery
- Amend the following FMPs to designate EFH and EFH-HAPCs: Snapper Grouper FMP; Coral FMP; *Sargassum* FMP

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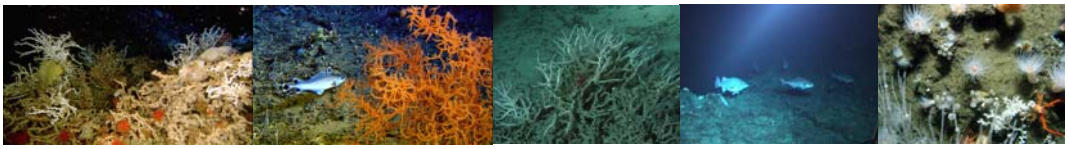
EXECUTIVE SUMMARY

COMPREHENSIVE ECOSYSTEM-BASED AMENDMENT 2 FOR THE SOUTH ATLANTIC REGION (CE-BA 2)



The South Atlantic Fishery Management Council (South Atlantic Council) is developing various management measures in order to address additional criteria for Fishery Management Plans required by the reauthorized Magnuson-Stevens Fishery Conservation and Management Act (2006). In the Comprehensive Ecosystem-Based Amendment 2 (CE-BA 2), actions are being proposed related to management of the octocoral fishery, modifying management of Special Management Zones off South Carolina, and modifying sea turtle and smalltooth sawfish release gear requirements in the Snapper Grouper Fishery. Additionally, non-regulatory actions are being proposed that would designate essential fish habitat (EFH) as well as essential fish habitat-habitat areas of particular concern (EFH-HAPCs) in specific Fishery Management Plans (FMPs) to ensure conservation and enhancement of habitat.

This document is intended to serve as a SUMMARY for all the actions and alternatives in CE-BA 2. It also includes a summary of the expected biological and socio-economic effects from the management measures.

Purpose and Need of the Proposed Actions

The *purpose* of CE-BA 2 is to amend Fishery Management Plans (FMPs) as needed to respond to ecosystem issues that may go across fisheries as opposed to single species management for these issues. CE-BA 2 intends to modify management of octocorals in the South Atlantic through the establishment of an annual catch limit (ACL), modify how Special Management Zones (SMZs) off South Carolina are managed, revise sea turtle release and smalltooth sawfish gear requirements for the snapper grouper fishery, and designate Essential Fish Habitat (EFH) and Essential Fish Habitat – Habitat Areas of Particular Concern (EFH-HAPC) in the South Atlantic.

The *need* of the action is to ensure overfishing does not occur and to allow the stocks to increase in biomass, when necessary, in order to maximize their reproductive potential so that populations may produce optimum yield (OY). OY, the ultimate goal of any fishery, is to allow for harvest of a portion of the fish stock that provides the greatest economic, social, and ecological benefit to the nation. The actions in CE-BA 2 are needed to remain in compliance with the Magnuson-Stevens Fishery Management and Conservation Act (Magnuson-Stevens Act), and to respond to concern from fishermen.

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

List of Management Actions

There are 8 actions in CE-BA 2 that will accomplish the Purpose and Need:

1. Modify management of octocorals in the South Atlantic
2. Extend the South Atlantic Fishery Management Council's (South Atlantic Council) management unit for octocorals into the Gulf of Mexico Fishery Management Council's (Gulf of Mexico Council) area of jurisdiction
3. Modify the ACL for octocorals in the South Atlantic
4. Modify management of SMZs off South Carolina
5. Modify sea turtle release gear requirements for the snapper grouper fishery
6. Amend the Snapper Grouper FMP to designate new EFH-HAPCs
7. Amend the Coral FMP to designate new EFH-HAPCs
8. Amend the FMP for Pelagic *Sargassum* habitat to designate new EFH

Background

The Octocoral Fishery

Octocorals, designated as Essential Fish Habitat, are commercially collected and sold live to wholesale and retail dealers and aquarium owners. The South Atlantic Council, along with the Gulf of Mexico Council, first described the fishery in their 1982 joint Coral Fishery Management Plan (Coral FMP). Amendment 1 of the Coral FMP specified the joint commercial quota for the harvest of allowable octocorals in Gulf and South Atlantic federal waters as 50,000 colonies per year. Amendment 3 of the Coral FMP prohibited harvest of octocorals north of Cape Canaveral, FL, where they constitute a significant portion of the live/ hardbottom habitat. Octocorals are primarily found in the Florida Keys region, where the majority are harvested in Florida state waters primarily for the aquarium industry. They are included under Florida Fish and Wildlife Conservation Commission's Marine Life Fishery Program, and managed through a limit on the number of commercial harvesters allowed (currently there are ~100-140 fishers) and also a recreational daily bag limit. Florida rules state that harvest of allowable octocorals will close in state waters when the adjacent federal quota has been met. To date, this fishery has never closed.

What are Octocorals?

Octocorals consist primarily of gorgonians as well as soft corals, horny corals, sea fans, sea whips, and sea pens. They contribute greatly to coral reef diversity, providing habitat for an array of managed fishery species and organisms. Similar to stony corals, octocorals are colonial animals with a polyp as the individual building unit. They have both sexual and asexual reproductive modes. Octocorals are sedentary and derive energy from sunlight, consumption of zooplankton, detritus and dissolved organics.

As a result of existing management mechanisms in place for octocorals, in Florida state waters, the South Atlantic Council is considering modifying the management unit for octocorals under the Coral FMP to maintain protection in federal waters off of North Carolina, South Carolina and Georgia. Protection for octocorals will remain in place in Florida state waters under their existing management program, Florida's Marine Life Fishery Program and Florida could extend management from state waters into federal waters off Florida. They are also considering the implications of other management measures for this fishery.

Special Management Zones off South Carolina

Artificial reefs in South Carolina waters are built and managed by South Carolina Department of Natural Resources (SCDNR) to promote recreational fishing opportunities. Construction is funded mostly by the recreational community through the South Carolina Saltwater Fishing License Program and federal Aid in Sportfish Restoration Program. Under the Snapper Grouper FMP, SCDNR may request the South Atlantic Council designate an artificial reef as a Special Management Zone (SMZ) (artificial reef and surrounding area) in order to prohibit or restrain the use of specific types of fishing gear. Currently 29 SMZs have been designated in federal waters offshore of South Carolina. The South Atlantic Council is concerned over reports of

Regulations for SMZs off South Carolina

- **Use of a powerhead to take South Atlantic snapper grouper is prohibited**
- **Fishing may only be conducted with handline, rod and reel, and spearfishing gear**
- **Use of a sea bass pot or bottom longline is prohibited**

commercial vessels operating on SMZs, a practice not keeping with the intended purpose of the SMZs. The Snapper Grouper FMP states that fishing gear offering "exceptional advantages" over other gear types may significantly reduce improved fishing opportunities and thus eliminate any incentive for establishing SMZs. An action has been developed to limit the harvest of certain species in the SMZs to the recreational bag limit.

Sea Turtle Release Gear Requirements

Current sea turtle release gear requirements were established in Amendment 15B to the Snapper Grouper FMP and include the same dehooking and disentanglement gear as required in the pelagic longline fishery. Since Amendment 15B's approval and implementation, concerns have been raised regarding the appropriateness of several required gear for smaller vessels carrying much lighter tackle than the pelagic longline fishery. An action has been developed to address these concerns and modify requirements for vessels in the snapper grouper fishery.

Designating Essential Fish Habitat

The Magnuson-Stevens Act directs the Councils to describe and identify essential fish habitat (EFH) for each federally managed species, to minimize the extent of adverse effects on habitat caused by fishing and non-fishing activities, and to identify actions to encourage conservation and enhancement of those habitats. Councils may also identify EFH-Habitat Areas of Particular Concern (EFH-HAPC). The South Atlantic Council is considering amending additional EFH-HAPC areas in the Snapper Grouper FMP, Coral FMP, as well as designating new EFH areas in the Pelagic *Sargassum* FMP.

Actions Addressing Octocorals

❖ Action 1. Modify Management of Octocorals in the South Atlantic

Alternative 1. No Action. Do not remove octocorals from the fishery management unit (FMU) under the South Atlantic Coral FMP.

Alternative 2. Remove octocorals from the FMU.

Preferred Alternative 3. Modify the FMU to indicate that octocorals are included in the EEZ off NC, SC and GA.

Impacts from Action 1

Biological

Under **Alternative 1 (No Action),** octocorals would continue to be managed under the Coral FMP and would be subject to a harvest level of 50,000 colonies combined for the Gulf and South Atlantic exclusive economic zone. Octocorals are considered a data-poor stock, with no stock assessment and limited landings information. Fishery-independent survey data indicate there is relatively high octocoral abundance in the historically known distribution area (the Florida Keys). The fishery is also managed in state waters under other management measures overseen by Florida Fish and Wildlife Conservation Commission (FWC; because the fishery largely exists in Florida state waters) including commercial permits, reporting requirements, and a six-colony recreational bag limit for octocorals.

Alternative 2 would remove octocorals from the Coral FMP and eliminate current management measures for octocorals in the South Atlantic. Under this alternative, octocorals would not be protected through a commercial quota, commercial permit, or reporting requirements in federal waters. Harvest of octocorals would be allowed in the five Deepwater Coral HAPCs, designated in CE-BA 1, and the *Oculina* Bank HAPC. **Alternative 2** may result in a significant increase in the harvest of octocorals however market demand for this species is limited and would likely be the driving factor in an increase in effort.

Preferred Alternative 3 would revise the fishery management unit to include octocorals off of Georgia, North Carolina, and South Carolina. Octocorals off of Florida would be removed from the Coral FMP and would result in no federal management by the South Atlantic Council. Although octocoral harvest is managed under the Coral FMP, the FWC is responsible for most of the management, implementation and enforcement of regulations because the majority of harvest occurs in state waters. **Preferred Alternative 3** should result in the same biological protection to the resource as is currently implemented.

Socio-economic

If the state of Florida extends their jurisdiction into federal waters, Florida waters can be protected and no short or long-term changes would be expected with regard to economic effects in Florida

waters. If Florida does not extend their jurisdiction into federal waters, landings would be allowed to increase in federal waters, although, as stated above, the market for octocorals would limit harvest. In this case, due to the possible increased risk of overfishing octocorals under **Alternative 2**, long-term economic benefits would be expected to decrease compared to **Alternative 1**. Short-term economic benefits could increase if the market demand for octocorals increases.

Without federal management in waters north of Florida (under **Alternative 2**), long-term economic effects would be expected to decline under **Alternative 2** compared to **Alternative 1**.

Under **Preferred Alternative 3**, if Florida extends their jurisdiction into federal waters, as they are expected to do, no short or long-term changes would be expected with regard to economic effects resulting from this action.

❖ Action 2. Extend the SAFMC's Fishery Management Unit (FMU) for Octocorals into the Gulf of Mexico Fishery Management Council's Area of Jurisdiction

Preferred Alternative 1. No Action. Do not extend the FMU for octocorals into the Gulf Council's jurisdiction.

Alternative 2. Extend the management boundaries for all octocorals species in the Coral FMP to include the Gulf Council's jurisdiction.

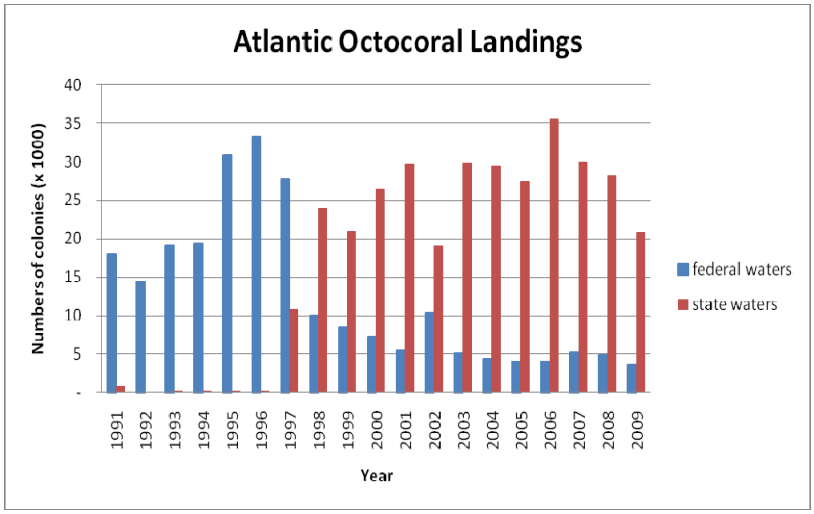


Figure 1 – Octocoral harvest in South Atlantic Federal and State waters for the period 1991-2009 (Source: FL FWC, FWRI)

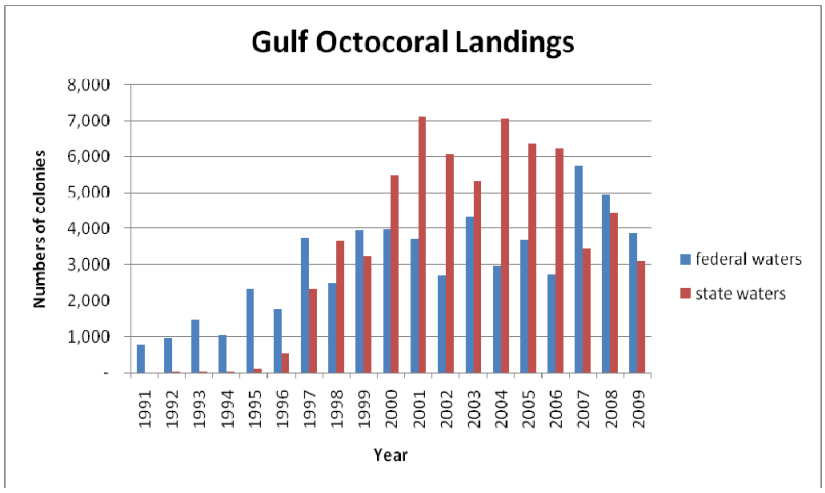


Figure 2 – Octocoral harvest in Gulf of Mexico Federal and State waters for the period 1991-2009 (Source: FL FWC, FWRI)

Impacts from Action 2

Biological

Currently, the quota for octocorals is 50,000 colonies combined in the Gulf and South Atlantic exclusive economic zone. **Preferred Alternative 1 (No Action)** would maintain the current biological impacts to the resource. **Alternative 2** would extend management jurisdiction of octocorals to include the Gulf Council's area of jurisdiction. Under both alternatives, the 50,000 colony quota applies to octocoral harvest in the Gulf of Mexico and the South Atlantic, combined, and would not result in increased biological impacts to the resource. **Preferred Alternative 1** and **Alternative 2** refer only to who manages the fishery and would not change the quota or the management mechanism currently in place.

Socio-economic

Extension of the FMU (**Alternative 2**) for octocorals into the Gulf Council's jurisdiction is largely an administrative action and there are no direct economic effects. There are no expected changes to long-term economic effects as a result of **Alternative 2** compared to **Preferred Alternative 1** since both protect octocorals to the same degree. As stated above, **Preferred Alternative 1** and **Alternative 2** refer only to who manages the fishery and would not change the quota or the management mechanisms currently in place.

❖ Action 3. Modify the Annual Catch Limit (ACL) for Octocorals in the South Atlantic

Alternative 1. No Action. Do not modify the existing ACL for octocorals in the South Atlantic (ACL=current 50,000 colony quota for South Atlantic and Gulf of Mexico EEZ).

Alternative 2. Modify the existing ACL in the South Atlantic and Gulf of Mexico (ACL=current 50,000 colony quota for South Atlantic and Gulf of Mexico EEZ) to include State waters.

Preferred Alternative 3. ACL = 0 for octocorals in the EEZ off NC, SC, and GA.

Annual Catch Limits (ACL)

The level of annual catch (pounds or numbers) that triggers accountability measures to ensure that overfishing is not occurring.

Year	*Combined South Atlantic and Gulf State Landings*	*Combined South Atlantic and Gulf federal Landings*	*Total Landings*
2000	31,847	11,253	43,100
2001	36,734	9,160	45,894
2002	25,024	13,114	38,138
2003	35,104	9,380	44,484
2004	36,406	7,352	43,758
2005	33,752	7,700	41,452
2006	41,822	6,745	48,567
2007	33,275	10,997	44,272
2008	32,651	9,841	42,492
2009	23,887	7,372	31,259

Table 1 - Landings of octocorals in both South Atlantic and Gulf Federal and State waters (Source: Landings data FL FWC, FWRI)

Impacts from Action 3

Biological

Alternative 1 (No Action) would continue to manage octocorals with the 50,000 colony quota and would not account for landings in state waters. Florida has implemented compatible regulations, which allow the state octocoral fishery to close when the federal quota is met, however, that quota has never been reached and the state fishery for octocorals has never been closed.

Alternative 2 would modify the existing annual catch limit (ACL) for octocorals to include landings from Gulf and South Atlantic state waters in addition to landings in the exclusive economic zone (EEZ). The majority of octocoral harvest occurs in the state waters off Florida. The landings off states in the Gulf and South Atlantic have not exceeded the 50,000 colony quota but have come fairly close. In November 2010, the South Atlantic Council's Scientific and Statistical Committee (SSC) recommended an acceptable biological catch (ABC) level of 50,000 colonies annually, including the Gulf and South Atlantic EEZ and state waters. (Councils review the SSC recommendations for ABC and set the ACL.) Combined landings for state and federal waters in the Gulf and South Atlantic have not reached the 50,000 colony quota but may in the future. **Alternative 2** would allow greater protection to the resource than **Alternative 1** by considering state landings towards the quota.

Preferred Alternative 3 would establish an ACL equal to 0 for the octocoral fishery but this action is dependent on the alternatives in Action 1. **Preferred Alternative 3** would result in no harvest of octocorals in the South Atlantic, and would only apply to octocoral harvest north of Florida. Currently, there is a prohibition of octocoral harvest and possession north of Florida, and this would continue under this alternative. The biological impacts to the resource would remain the same as the status quo.

Socio-economic

Landings in state and federal waters have never exceeded the **Alternative 2** proposed ACL, and therefore, there are no expected short-term economic losses to fishermen of implementation of the 50,000 quota as the ACL. However, there could be an economic loss suffered by fishermen who have made investments toward expanding harvest operations in the future. Also, in the case where state and federal landings of octocorals are underreported, economic losses could occur. However, this cannot be quantified because there is no record that this is occurring.

Because there are no landings of octocorals occurring in federal waters north of Florida, and harvest of octocorals is prohibited north of Cape Canaveral, FL, the **Preferred Alternative 3** (ACL = 0) is not expected to result in any negative economic effects.

Actions Addressing SMZs and Sea Turtle Gear Requirements

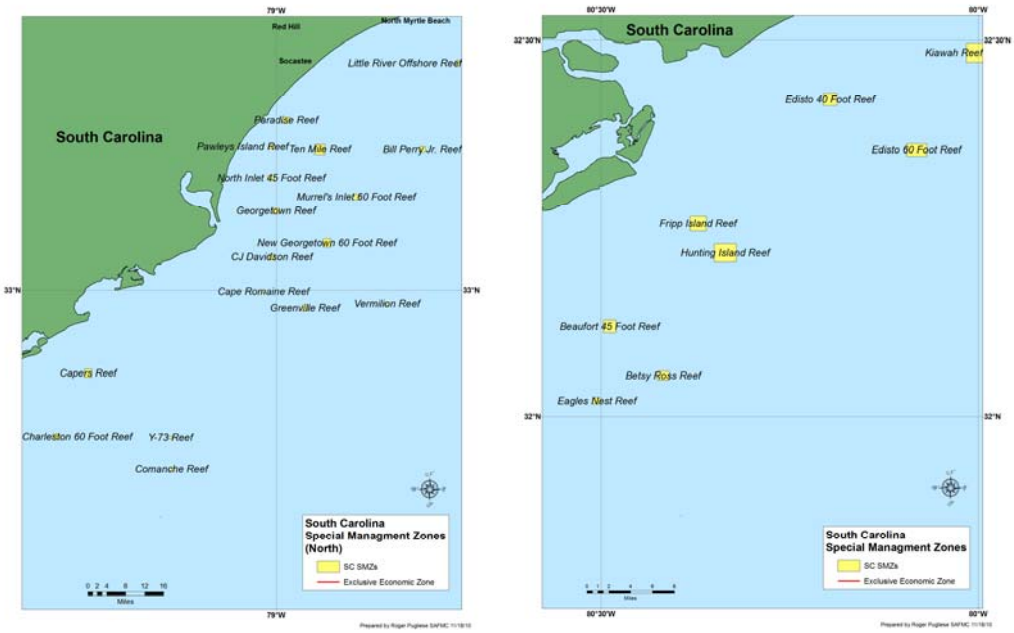
❖ Action 4. Modify Management of Special Management Zones (SMZs) off South Carolina

Alternative 1. No Action. Do not modify the current management of SMZs off South Carolina.

Preferred Alternative 2. Limit harvest and possession of snapper grouper species (with the use of all non-prohibited fishing gear) in SMZs off South Carolina to the recreational bag limit.

Preferred Alternative 3. Limit harvest and possession of coastal migratory pelagic species (with the use of all non-prohibited fishing gear) in SMZs off South Carolina to the recreational bag limit.

Alternative 4. Prohibit use of hand spear and spear guns in SMZs off South Carolina.



Figures 3 and 4 – Special Management Zones off South Carolina, North and South geographic areas

Impacts from Action 4

The intended purpose behind the designation of an artificial reef as an SMZ is to "prohibit or restrain the use of specific types of fishing gear that are not compatible with the intent of the permittee for the artificial reef." Designating an artificial reef as an SMZ preserves the fishing opportunities artificial reefs provide and serves as an incentive to establish them. Fishing gear that offers "exceptional advantages" over other gear types may significantly reduce the improved fishing opportunities, and eliminate the incentive for developing an artificial reef, which would prevent improved fishing opportunities that would not otherwise exist (Snapper Grouper FMP, SAFMC 1983).

Biological

Modifying management of the SMZs to restrict commercial fishing effort to the bag limit could possibly reduce the amount of harvest and have a positive biological impact on the species regularly targeted. However, there is little information on the amount of commercial harvest in the SMZs and any commercial effort is expected to be small. In general, given that an expected decrease in commercial harvest could occur, long-term biological benefits are expected as a result of **Preferred Alternative 2** and **Preferred Alternative 3,** and also **Alternative 4**.

Socio-economic

South Carolina artificial reef users in 2006 represented an economic impact (i.e., economic importance) of approximately $83 million in total sales (output) that generated approximately 1,000 jobs (Rhodes and Pan, 2007). One of the goals of implementing the SMZ structures was to maintain intended socioeconomic benefits of the SMZs to recreational anglers.

Commercial landings of species caught on these artificial reefs cannot be quantified due to the way that logbook landings are recorded. Both **Preferred Alternative 2** and **Preferred Alternative 3** would be expected to result in small reductions in ex-vessel revenues to commercial fishermen, although some mitigation of these reductions could occur as a result of fishing in other areas. At the same time, **Preferred Alternative 2** and **Preferred Alternative 3** would be expected to result in increased economic benefits to recreational fishermen as a result of allocation of the harvest that would otherwise be taken by commercial fishermen.

The effect of **Alternative 4** on the recreational fishery of South Carolina is expected to be significant. Any estimate of losses due to **Alternative 4** would likely be an overestimate of actual losses.

❖ Action 5. Modify Sea Turtle Release Gear Requirements for the Snapper Grouper Fishery

Alternative 1. No Action. Maintain current sea turtle and smalltooth sawfish release gear requirements for the snapper grouper fishery in federal waters of the South Atlantic. Currently, required gear (regardless of freeboard height) includes:

- a long-handled line clipper or cutter,
- a long-handled dehooker for ingested hooks,
- a long-handled dehooker for external hooks,
- a long-handled device to pull an "inverted V",
- a dipnet,
- a tire (or other comparable cushioned, elevated surface that immobilizes boated sea turtles),
- a short-handled dehooker for ingested hooks,
- a short-handled dehooker for external hooks,
- long-nose or needle-nose pliers,
- bolt cutters,
- monofilament line cutters, and
- at least two types of mouth openers/mouth gags

This equipment must meet the specifications described in 50 CFR 635.21(c)(5)(i)(A-L) with the following modification: any other comparable, cushioned, elevated surface that allows boated sea turtles to be immobilized, may be used as an alternative to the requirement in 50 CFR 635.21(c)(5)(i)(F) to have a tire on board.

Alternative 2. Require all federally-permitted hook-and-line vessels with no longline gear onboard to have and use a tool capable of cutting the fishing line and a tool capable of removing a hook from a sea turtle or smalltooth sawfish. Fishermen would still be required to comply with all current sea turtle and smalltooth sawfish release guidelines.

Alternative 3. Require all sea turtle release and smalltooth sawfish gear listed under Alternative 1 (No Action) for federally-permitted snapper grouper vessels using longline gear, and require [insert specific sea turtle release gear] for federally-permitted vessels fishing with hook-and-line gear.

Preferred Alternative 4. Modify sea turtle and smalltooth sawfish release gear based on freeboard height. Fishermen would still be required to comply with all current sea turtle and smalltooth sawfish release guidelines. The design specifications of required gear and the handling and release techniques employed must comply with those described in the NOAA Fisheries Service document entitled "Careful Release Protocols for Sea Turtle Release with Minimal Injury."
NOTE: **Preferred Alternative 4** is recommended by the Southeast Regional Office of Protected Resources Division as the minimum requirement necessary to remain in compliance with the biological opinion.

Sub-Alternative 4a. Vessels with freeboard height of 4 feet or less would be required to carry and use:

- a short-handled dehooker for ingested hooks; or a dehooker for ingested and a dehooker for external hooks,

- long-nose or needle-nose pliers,
- bolt-cutters,
- mono-filament line cutters,
- cushion/support device (i.e., boat cushion),
- a dipnet,
- at least two types of mouth openers/mouth gags

Sub-Alternative 4b. Vessels with freeboard height greater than 4 feet (and/or using longline gear) would be required to carry and use:

- a long-handled line cutter,
- a long-handled dehooker for ingested hooks; or a dehooker for ingested and a dehooker for external hooks,
- a long-handled device to pull an "inverted V",
- a dipnet,
- cushion/support device (i.e., boat cushion),
- a short-handled dehooker for ingested hooks; or a dehooker for ingested and a dehooker for external hooks,
- long-nose or needle-nose pliers,
- bolt cutters,
- monofilament line cutters, and
- at least two types of mouth openers/mouth gags

Alternative 5. Modify the design specifications of the current sea turtle release and smalltooth sawfish gear equipment for all federally-permitted non-longline snapper grouper vessels with hook-and-line gear on board to match the specifications described in the NOAA Fisheries Service document entitled "Careful Release Protocols for Sea Turtle Release with Minimal Injury." (See **Appendix K**)

South Atlantic Council may select one or more sub-alternatives. Choosing additional sub-alternatives would be especially beneficial for species conservation, but not required to remain in compliance with the biological opinion.

Sub-Alternative 5a. Require all federally-permitted non-longline snapper grouper vessels with hook-and-line gear on board:

- a short-handled dehooker for ingested hooks, or a short-handled dehooker for external hooks,
- cushion/support device (i.e., standard automobile tire or boat cushion),
- long-nose or needle-nose pliers,
- bolt-cutters,
- mono-filament line cutters,
- a dipnet,
- at least two types of mouth openers/mouth gags

Sub-Alternative 5b. Also require:

- a long-handled dehooker for ingested hooks, or a long-handled dehooker for external hooks

Sub-Alternative 5c. Also require:

- a long-handled line clipper or cutter

Sub-Alternative 5d. Also require:

- a long-handled device to pull an "inverted V"

Impacts from Action 5

Biological

Alternative 1 (No Action) would maintain the current sea turtle and smalltooth sawfish release gear requirements for the snapper grouper fishery. The dehookers, line cutters, and bolt cutters specified under current regulations were designed for and are required in the highly migratory species pelagic longline and shark bottom longline fisheries. Utilizing specialized dehooking and disentanglement gear has been shown to reduce hooking mortality in sea turtles; however, there is some concern that using sea turtle dehooking equipment not designed for the lighter tackle typically used by snapper grouper fishermen could in fact harm sea turtles or smalltooth sawfish during the dehooking process. If the heavier-duty dehooking gear required under **Alternative 1 (No Action)** is causing harm, or is less effective than gear designed for lighter tackle, the benefits of using the current gear may not be as great as could be achieved under other alternatives.

Alternatives 2 and **3** modify the sea turtle and smalltooth sawfish release gear specifications for vessels carrying hook-and-line gear on board that is not longline gear. Under these alternatives, all vessels with longline gear on board will be required to continue carrying all the dehooking and disentanglement gears outlined in **Alternative 1**. Under **Alternative 2**, the only tools that would be required for vessels carrying non-longline, hook-and-line gear are a tool capable of cutting fishing line, such as a knife, and a tool capable of removing a hook from a sea turtle, such as a pair of pliers. Because of the requirements of the biological opinion outlining how sea turtle and smalltooth sawfish release equipment should be implemented, **Alternative 2** would not be in compliance with the biological opinion.

Alternative 3 differs from **Alternative 2** by identifying specific types of sea turtle and smalltooth sawfish release equipment for snapper grouper vessels carrying hook-and-line gear onboard. **Alternative 3** also maintains the status quo requirement for snapper grouper vessels carrying longline gear onboard. The compliance of this alternative with the biological opinion would depend on which specific types of sea turtle and smalltooth sawfish release equipment were ultimately required.

Preferred Alternative 4 would require different lengths and types of dehooking tools dependent upon the freeboard height of the vessel, which tracks the sea turtle release gear regulations in the Gulf of Mexico. **Preferred Alternative 4** also offers the option of tailoring sea turtle and smalltooth sawfish release gear specifications to increase effectiveness when used with lighter tackle in the snapper grouper fishery. The biological benefits of **Preferred Alternative 4** are likely to be similar to Alternative 1. **Preferred Alternative 4** and its sub-alternatives reference the updated release gear design specifications that now include a wider range of gear design parameters. These new parameters should be appropriate for the lighter tackle used in the snapper grouper fishery.

Alternative 5 would modify the design specifications of the current sea turtle release gear requirements for all federally-permitted non-longline snapper grouper vessels with hook-and-line gear on board. **Sub-alternative 5a** would require a minimum set of release equipment more appropriate for the smaller tackle used in the snapper grouper hook-and-line fishery. The biological benefit of **sub-alternative 5a** would likely be similar to **Alternative 1**. The changes in design specifications to the required equipment could make them more effective in releasing hooked or disentangled sea turtles or smalltooth sawfish. Under these circumstances the biological benefits

from **sub-alternative 5a** may be greater than **Alternative 1**. Since each piece of equipment has new design criteria, each piece is likely to be more effective at dehooking and disentangling the lighter tackle used in the fishery. Selecting all four sub-alternatives is likely to have the greatest biological benefit of the all the proposed alternatives. This would ensure that both short- and long-handled release equipment are on board, and that those gears are designed to handle lighter tackle.

Socio-economic

Under **Alternative 1 (No Action)**, expenses totaled $617-$1,115 (2006 dollars) per vessel as estimated in Snapper Grouper Amendment 15B.

Alternatives 2 and **3** attempt to better match gear with the vessel and are likely to yield greater biological and economic benefits than **Alternative 1**. While **Alternative 2** and the other alternatives may result in increased economic benefits resulting from increased long-term biological benefits compared to **Alternative 1 (No Action)** because more appropriate release gear is being used, effectiveness is difficult to estimate and enforcement may be difficult since success relies heavily on how well sea turtle release guidelines are adhered to.

Alternative 3 is expected to yield slightly higher long-term economic benefits than **Alternatives 1** and **2**. Appropriate cutting and de-hooking gear is assumed to already be on board all vessels, so no additional gear costs would be expected to be incurred under **Alternatives 2** and **3**.

Out-of-pocket release gear expenses per *new entrant* for **Preferred Alternatives 4a** and **4b** are estimated to range from $324-$490 for vessels with less than 4 feet freeboard and from $564-$987 for vessels with more than 4 feet freeboard. There are no release gear expenses for those already participating in the fishery since all of the gear required under **Preferred Alternatives 4a** and **4b** is already required under **Alternative 1 (No Action)**.

No negative economic effects would be expected as a result of the **Alternative 5** sub-alternatives unless fishermen purchased the smaller gears identified in the sub-alternatives.

Actions Addressing EFH

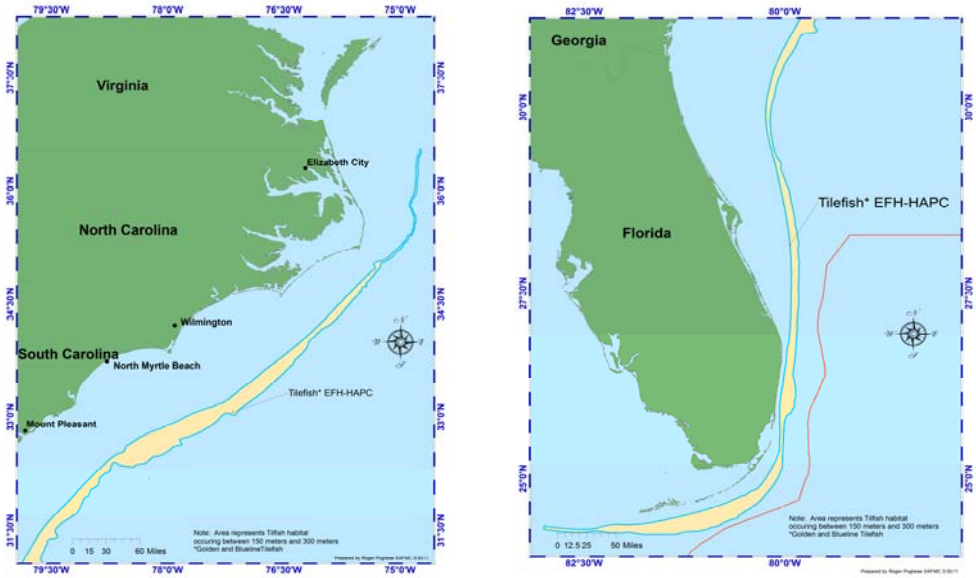
❖ Action 6. Amend the Snapper Grouper FMP to designate new EFH-HAPCs

Alternative 1. No Action. Do not amend the Snapper Grouper FMP to designate new Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs).

Preferred Alternative 2. Amend the Snapper Grouper FMP to designate one or more of the following EFH-HAPCs:

Sub-alternative 2a. Designate 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.

Sub-alternative 2b. Designate 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.



Figures 5 and 6 – Tilefish Essential Fish Habitat - HAPC

Preferred Alternative 3. Designate 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
- East Hump MPA

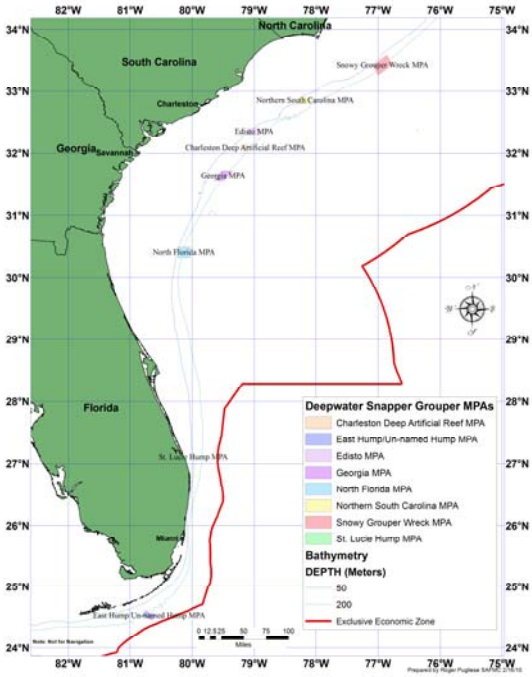


Figure 7 - Deepwater Snapper Grouper MPAs

Impacts from Action 6

Biological

Alternative 1 (No Action) would not add an area highlighting the importance of golden tilefish and blueline tilefish, or an area emphasizing the value of the habitat in the MPAs (established in Snapper Grouper Amendment 14). **Preferred Alternative 2** addresses an oversight in the initial designation of snapper grouper EFH through Amendment 10 to the Snapper Grouper FMP in the Comprehensive EFH Amendment, and while considered EFH, the area was not included in the proposed list of EFH-HAPCs. **Preferred Alternative 2a** for golden tilefish and **Preferred Alternative 2b** for blueline tilefish propose detailed descriptions for EFH-HAPCs. **Preferred Alternative 3** would designate previously specified deepwater MPAs as EFH-HAPCs. This alternative is intended to protect these MPAs as a unique habitat complex and require enhanced EFH consultations pertaining to non-fishing activities that could potentially impact these protected habitats.

EFH-HAPC designation would provide a future opportunity for the South Atlantic Council to establish regulations to protect EFH from fishing activities in the EEZ and to review and recommend EFH conservation measures to protect surface waters from non-fishing activities which are undertaken, authorized, or funded by federal agencies.

Socio-economic

Designation of additional EFH-HAPCs will require the South Atlantic Council to consider all operations or actions that might interact with or affect the EFH-HAPC, and may trigger a consultation for any activity that may affect the habitat. The direct effects of additional regulatory consideration would be the financial costs of a lengthy regulatory process. Additional effects would accrue to any restrictions imposed as a result of the evaluation of impact of these activities. A consultation may incur costs associated with production delays, project/activity design modification, or mitigation measures. Assuming the areas are appropriate to the resource, both **Preferred Alternative 2** and **Preferred Alternative 3** would be expected to result in greater protection of the resource than **Alternative 1 (No Action)** and provide for increased long-term economic benefits.

❖ Action 7. Amend the Coral Fishery Management Plan to designate new EFH – Habitat Areas of Particular Concern (EFH-HAPCs)

Alternative 1. No Action. Do not amend the Coral FMP to designate new Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs).

Preferred Alternative 2. Amend the Coral FMP to designate the following Deepwater Coral HAPCs as designated in Comprehensive Ecosystem-Based Amendment 1 as EFH-HAPCs: Cape Lookout Coral HAPC, Cape Fear Coral HAPC, Blake Ridge Diapir Coral HAPC, Stetson-Miami Terrace Coral HAPC, Pourtalés Terrace Coral HAPC.

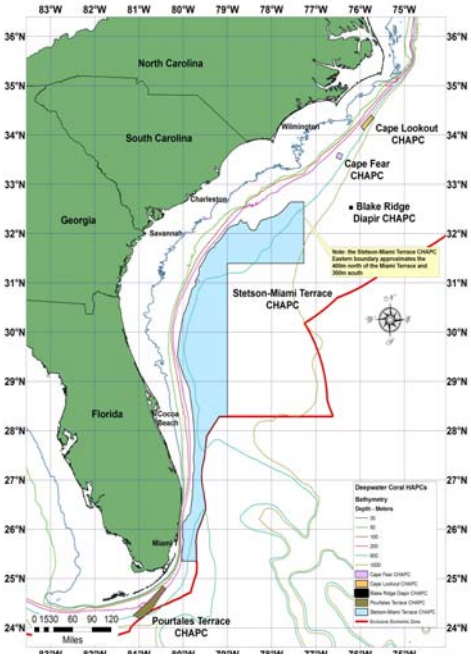


Figure 8 - Deepwater Coral HAPCs

Impacts from Action 7

Biological

Alternative 1 (No Action) would not propose additional EFH-HAPCs intended to aid in the conservation of coral and live bottom habitat, especially when addressing policy or permit activities associated with non-fishing activities.

Preferred Alternative 2 proposes to further emphasize the importance of these protected deepwater ecosystems by designating them as EFH-HAPCs. The EFH-HAPC designation under this option would provide a future opportunity for the South Atlantic Council to establish regulations to protect EFH from fishing activities in the EEZ and to review and recommend EFH conservation measures to protect habitat from non-fishing activities which are undertaken authorized, or funded by federal agencies.

Socio-economic

Designation of EFH-HAPC will require the South Atlantic Council to consider all operations or actions that might interact with or affect the EFH-HAPC, and may trigger a consultation for any activity that may affect the habitat. The direct effects of additional regulatory consideration would be the financial costs of a lengthy regulatory process. Additional effects would accrue to any restrictions imposed as a result of the evaluation of impact of these activities. A consultation may incur costs associated with production delays, project/activity design modification, or mitigation measures. Assuming the area is appropriate to the resource, **Preferred Alternative 2** would be expected to result in greater protection of the resource than **Alternative 1 (No Action)** and provide for increased long-term economic benefits over **Alternative 1 (No Action)**.

❖ Action 8. Amend the Fishery Management Plan for Pelagic *Sargassum* Habitat to Designate EFH

Alternative 1. No Action. Do not amend the *Sargassum* FMP to designate Essential Fish Habitat (EFH). The South Atlantic Council must designate EFH for all managed species including Pelagic *Sargassum* Habitat.

Alternative 2. Amend the *Sargassum* FMP to designate the top 10 meters of the water column in the South Atlantic EEZ as EFH for Pelagic *Sargassum*.

Preferred Alternative 3. Amend the *Sargassum* FMP to designate the top 10 meters of the water column in the South Atlantic EEZ bounded by the Gulfstream, as EFH for pelagic *Sargassum*.

Impacts from Action 8

Biological

Alternative 1 (No Action) would not specify EFH for *Sargassum* and would not be in compliance with the EFH final rule. **Alternative 2** proposes an EFH designation that includes the top ten meters of the water column where it occurs in the South Atlantic. **Preferred Alternative 3** proposes a smaller EFH designation than **Alternative 2** that includes the top ten meters of the water column in the South Atlantic with the bounds of the Gulf Stream being the most eastern boundary. The Gulf Stream is the most significant oceanographic feature supporting *Sargassum* species occurrence, distribution and transport.

Limiting the EFH identification to the upper 10 meters of the surface as bounded by the Gulf Stream was recommended by NOAA Fisheries Service in the development of the Final Environmental Impact Statement for the Pelagic *Sargassum* Habitat FMP. The identification of essential habitat for pelagic *Sargassum* enables the South Atlantic Council to protect EFH more effectively and take timely actions when necessary. Identifying and describing EFH is the first step in preventing decreases in biological productivity of pelagic *Sargassum* and other managed or prey species dependent on pelagic *Sargassum*.

Socio-economic

The identification of EFH for pelagic *Sargassum* will not have any direct economic impacts. However, this measure will enable the South Atlantic Council to protect EFH effectively and take timely actions when necessary which could lead to increased net economic benefits to society. Assuming the area is appropriate to the resource, **Preferred Alternative 3** would be expected to result in greater protection of the resource than **Alternative 1 (No Action)** and **Alternative 2** and is expected to increase long-term economic benefits compared **Alternative 1 (No Action)** and **Alternative 2**.

1 Introduction

1.1 Background

The South Atlantic Fishery Management Council (South Atlantic Council) manages the snapper grouper, coastal migratory pelagic fisheries, coral and coral reefs and *Sargassum* fisheries in the South Atlantic exclusive economic zone (EEZ) (**Figure 1-1**) under their respective Fishery Management Plans (FMPs). The FMPs and their amendments are developed under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), other applicable federal laws, and executive orders. The species managed under the FMPs addressed in this amendment are listed in **Table 1-1**.

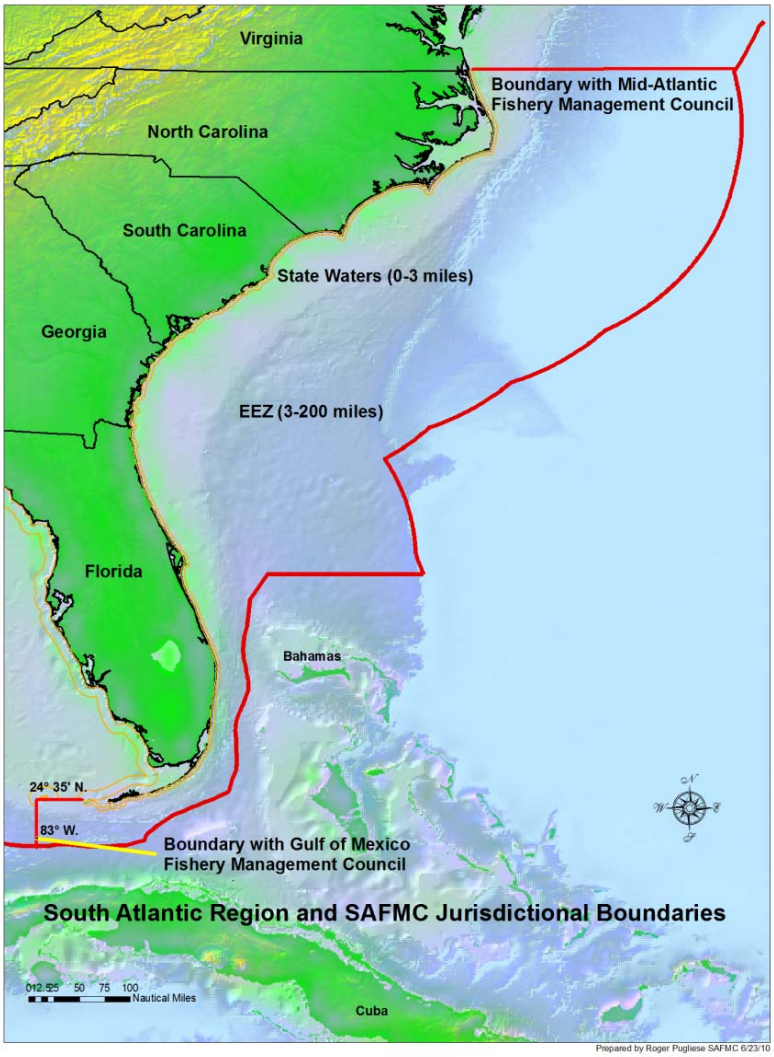


Figure 1-1. Jurisdictional boundaries of the South Atlantic Fishery Management Council.

Table 1-1. Species in the FMUs for Snapper Grouper, Coastal Migratory Pelagic, Coral and *Sargassum*.

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

Coastal Migratory Pelagic FMU
Cero *Scomberomous regalis*
Cobia *Rachycentron canadum*
King mackerel *Scomberomous cavalla*
Spanish mackerel *Scomberomorus maculates*
Little tunny *Euthynnus alleterattus*

Coral Reefs and Live Hard Bottom Habitat FMU
Coral belonging to the Class Hydrozoa (fire corals and hydrocorals) and coral belonging to the Class Anthozoa (sea fans, whips, precious corals, sea pens and stony corals).

Stony Corals – species belonging to Class Hydrozoa, Class Anthozoa, Subclass Zoantharia
Octocorals – Class Anthozoa, Subclass Octocorallia (including sea fans, *Gorgonia ventalina*, *Gorgonia flabellum*)

Coral reefs constitute hardbottoms, deepwater banks, patch reefs and outer bank reefs as defined in the Coral, Coral Reefs and Live/Hardbottom Habitat FMP (SAFMC 1995).
In addition, live rock comprises living marine organisms, or an assemblage thereof, attached to a hard substrate, including dead coral or rock (but excluding individual mollusk shells).

***Sargassum* FMU**
Sargassum fluitans
Sargassum natans

1.2 Purpose of the Proposed Action

The purpose of Comprehensive Ecosystem-Based Amendment 2 (CE-BA 2) is to modify management of octocorals through the establishment of an annual catch limit (ACL); modify management of Special Management Zones (SMZs) off South Carolina; revise sea turtle release gear requirements for the snapper grouper fishery; and designate new essential fish habitat (EFH) and EFH-habitat areas of particular concern (EFH-HAPCs) in the South Atlantic. These actions are needed to remain in compliance with the Magnuson-Stevens Act, and to respond to concern from fishermen.

This amendment proposes to specify the ACL for octocorals in the South Atlantic region. The South Atlantic Council is considering modifying the fishery management unit (FMU) for octocorals under the Fishery Management Plan for Coral, Coral Reefs, and Live/Hardbottom Habitats (Coral FMP) to indicate that octocorals are included in the exclusive economic zone (EEZ) off of North Carolina, South Carolina, and Georgia. As such, the South Atlantic Council is also considering an action to set the ACL for octocorals at zero. Alternatively, this amendment also includes an action that considers extending the management unit for octocorals into the Gulf of Mexico Fishery Management Council's area of jurisdiction.

CE-BA 2 would amend the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP) and FMP for the Coastal Migratory Pelagic Resources in the Atlantic and Gulf of Mexico (Coastal Migratory FMP) to require harvest (with the use of all non-prohibited fishing gear) and possession of managed species in SMZs off South Carolina to be limited to the recreational bag limit for snapper grouper and coastal migratory pelagic species. This action responds to concern from fishermen about potential user conflicts in SMZs off South Carolina.

An action to modify sea turtle release gear requirements for the snapper grouper fishery is also included in CE-BA 2. Fishermen have expressed concern that the current sea turtle handling and release gear requirements are intended for larger longline vessels using heavy tackle and are ineffective and unwieldy for smaller snapper grouper hook-and-line vessels.

This amendment would amend South Atlantic Council FMPs as needed to designate new or modify existing EFH and EFH-HAPCs. CE-BA 2 would amend the Snapper Grouper FMP and the Coral FMP to designate additional EFH-HAPCs. To meet the Magnuson-Stevens Act requirement that all managed species have EFH designated, CE-BA 2 amends the Pelagic *Sargassum* Habitat of the South Atlantic Region (*Sargassum* FMP) to designate EFH.

1.3 Need for the Proposed Action

The actions in CE-BA 2 are *needed* to remain in compliance with the Magnuson-Stevens Act, and to respond to concern from fishermen.

1.4 Management Objectives

Management objectives of the Coral FMP addressed by this amendment include the following:

1. Minimize, as appropriate, adverse human impacts on coral and coral reefs;
2. Provide, where appropriate, special management for Coral Habitat Areas of Particular Concern;
3. Increase public awareness of the importance and sensitivity of coral and coral reefs and;
4. Provide a coordinated management regime for the conservation of coral and coral reefs.

Management objectives of the Snapper Grouper FMP addressed by this amendment include the following:

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

Management objectives of the Coastal Migratory Pelagic FMP addressed by this amendment include the following:

<u>King Mackerel</u>

1. Institute management measures necessary to prevent exceeding the maximum sustainable yield (MSY).
2. Minimize gear and user group conflicts.

<u>Spanish Mackerel</u>

1. Institute management measures to prevent exceeding MSY.
2. Minimize gear and user group conflicts in the event they arise.
3. Promote the maximum use of the resource up to the OY estimate.

<u>Cobia</u>

1. Institute management measures necessary to increase yield per recruit and average size and to prevent overfishing.

Management objectives of the *Sargassum* FMP addressed by this amendment include the following:

1. Establish a management structure to regulate pelagic *Sargassum* habitat.
2. Reduce the impact of the pelagic *Sargassum* fishery on essential fish habitat.

3. Reduce the potential for conflict.
4. As a federally-managed species/habitat, direct needed research to better determine distribution, production, and ecology of pelagic *Sargassum* habitat.

1.5 History of Management

A summary of the history of management for Coral, Snapper Grouper, Coastal Migratory Pelagics and *Sargassum* FMPs can be found in **Appendix G**. More information on the history of management can be found online at: **www.safmc.net**.

2 Management Alternatives

This section outlines the proposed actions and alternatives considered by the South Atlantic Fishery Management Council (South Atlantic Council). A complete analysis of these alternatives can be found in **Section 4.0.** These alternatives were identified and developed through multiple processes, including the scoping meetings and public hearings conducted for the Comprehensive Ecosystem-Based Amendment 2 (CE-BA 2), meetings of the South Atlantic Council, the South Atlantic Council's Habitat and Ecosystem Committees, Habitat and Environmental Protection Advisory Panel, Coral Advisory Panel, and Scientific and Statistical Committee (SSC).

Alternatives the South Atlantic Council considered during the development of this amendment but eliminated from further detailed study are described in **Appendix F**.

The Magnuson-Stevens Fishery Management and Conservation Act (Magnuson-Stevens Act) requires specification of overfishing limits (OFLs), annual catch limits (ACLs) and accountability measures (AMs). The Magnuson-Stevens Act also requires that for species undergoing overfishing, ACLs must be established at a level that prevents overfishing by the end of 2010. The Magnuson-Stevens Act also requires AMs, which are management controls to prevent ACLs from being exceeded; and include corrective measures if overages occur.

ACLs and AMs must be established for all other species managed by the South Atlantic Council (with the exception of species with an annual life cycle) by the end of 2011. ACLs and AMs for octocorals are being addressed in this amendment.

The final National Standard 1(NS1) guidelines recognize that existing fishery management plans (FMPs) may use terms and values that are similar to, associated with, or may be equivalent to OFL, ABC, ACLs, annual catch targets, and AMs. As such, the South Atlantic Council has removed actions from this document establishing the maximum sustainable yield (MSY), OFL, ABC, and AMs as existing values have been specified within previous amendments to the FMP for Coral, Coral Reefs, and Live/Hardbottom Habitats of the South Atlantic Region (Coral FMP) that are equivalent to the required values under the Magnuson-Stevens Act.

These actions include:

<u>Establishing MSY for Octocorals in the South Atlantic</u>

The Coral FMP (SAFMC 1990) cited lack of sufficient data on biomass and mortality, and the absence of a fishery from which catch and effort data may be obtained, as factors preventing any calculation of MSY from the entire management area for the octocoral fishery. When the South Atlantic Council revisited this issue during the development of the Comprehensive Sustainable Fishery Act Amendment (SAFMC 1998c), the same conclusions were drawn and no estimate of MSY was provided.

An estimate of MSY has been determined for several coral species at specific reefs in the Florida reef tract, but cannot be expanded to other corals due to great differences in species, densities, growth rates, and other factors. The South Atlantic Council's SSC indicated at their August 2010 meeting that although the MSY value is unknown, it is estimated to be some value higher than the 50,000 colony status quo quota. The SSC believes that overfishing is not occurring because the octocoral fishery is small and effort and participation in Florida waters (where most of the harvest occurs) is capped by a limited entry program; there are no signs of local depletion in areas where the fishery operates; and there are no indications that the fishery has been operating at unsustainable levels.

Establish an Overfishing Level (OFL) for Octocorals in the South Atlantic

Amendment 5 to the Coral FMP included in the Comprehensive SFA Amendment (SAFMC 1998c) defines overfishing as the level of harvest that exceeds Optimum Yield (OY). OY for allowable octocorals in the South Atlantic and Gulf exclusive economic zone (EEZ) is not to exceed 50,000 colonies per year and fishing for octocorals in the EEZ will cease when the quota is reached (Coral FMP, Amendment 1 1990). The level of harvest in the South Atlantic and Gulf of Mexico EEZ has never exceeded OY and the fishery has never been closed in federal waters, thus overfishing has not occurred.

At their August 2010 meeting, the SSC discussed the lack of a stock assessment for octocorals and limited landings information. The SSC determined an estimate of OFL could not be quantified but is considered to be an unknown value above ABC. The South Atlantic Council further discussed the fact that there are no signs of local depletion in areas where the octocoral fishery operates or any other indication that the fishery has been operating at unsustainable levels.

Establish Acceptable Biological Catch (ABC) for Octocorals in the South Atlantic

In April 2010, the SSC met to discuss development of an ABC control rule for data poor stocks, including octocorals. The South Atlantic Council received the proposed data-poor control rule in June 2010. However, some aspects of the proposed ABC control rule and its criteria were considered inappropriate considering guidance that the rule should account for scientific uncertainty. The SSC was asked to reconvene in August 2010 to reconsider an ABC control rule for data poor stocks, including octocorals. At their August 2010 meeting, the SSC reviewed and discussed background information on octocoral landings, life history, and possible fishery reference points. The SSC discussed the fact that there is no stock assessment for octocorals, landings information is limited, and an estimate of OFL could not be provided but is considered to be an unknown value above ABC. Fishery-independent information is also limited but available survey data (monitoring programs and directed studies conducted by Florida Fish and Wildlife Conservation Commission (FWC), University of North Carolina-Wilmington, and University of Georgia suggests relatively high octocoral abundance in the historically known distribution area (Florida Keys).

The SSC recommended no changes to the current quota and recommended an ABC of 50,000 colonies annually for Gulf of Mexico and South Atlantic EEZ waters, combined. The SSC was asked to clarify their ABC recommendation during their November 2010 meeting. They explained the current quota is set at a value higher than what is historically landed. Based upon the number of licensed participants (100-140 fishers), the magnitude of landings, and the quota never having been met, they clarified it was their intent for the ABC recommendation for octocorals to include Gulf of Mexico and South Atlantic EEZ and state waters. Because the ABC for octocorals is an existing value provided by the SSC, it was removed as an action from the document.

Establish Accountability Measures (AMs) for Octocorals in the South Atlantic

Once the annual octocoral quota of 50,000 colonies in the South Atlantic and Gulf of Mexico EEZ is reached, the federal fishery will close. This provision was established in Coral Amendment 1 to the Coral FMP (SAFMC 1990) and is considered an accountability measure for the fishery. For this reason, an action to specify an additional AM for this fishery does not need to be considered in this amendment.

2.1 Action 1. Modify management of octocorals in the South Atlantic

Alternative 1. No Action. Do not remove octocorals from the fishery management unit (FMU) under the South Atlantic Coral FMP.

Alternative 2. Remove octocorals from the FMU.

Preferred Alternative 3. Modify the FMU to indicate that octocorals are included in the EEZ off NC, SC, and GA.

2.1.1 Comparison of Alternatives

Under **Alternative 1 (No Action),** octocorals would continue to be managed through the South Atlantic Coral FMP and would be subject to a harvest level of 50,000 colonies combined for the Gulf of Mexico and South Atlantic EEZ. Octocorals are considered to be data-poor with no stock assessment and limited landings information. Fishery-independent survey data indicate there is relatively high octocoral abundance in the historically known distribution area (Florida Keys). The fishery is also managed under other management measures including commercial permits, reporting requirements, and a six-colony recreational bag limit for octocorals. The FWC is responsible for most of the management, implementation and enforcement of the regulations because most of the effort in the fishery occurs in state waters. Octocoral harvest off of Georgia, South Carolina, and North Carolina will continue to be prohibited in federal waters.

Alternative 2 would remove octocorals from the Fishery Management Plan (FMP) for Coral, Coral Reefs, and Live/Hardbottom Habitats of the South Atlantic Region (Coral FMP) and

would eliminate current management measures for octocorals in the South Atlantic. Although the FWC could extend their management to octocorals in federal waters off Florida, there would be no protection of the resource in federal waters off Georgia, South Carolina and North Carolina. Additionally, during their October 2010 meeting, the Gulf of Mexico Fishery Management Council (Gulf Council) selected a preferred alternative to remove octocorals from their Fishery Management Plan for Corals and Coral Reefs of the Gulf of Mexico (Gulf Coral FMP) as a result of FWC expressing an interest in managing the fishery in the Gulf EEZ off FL. However, currently the only harvest of octocorals in the Gulf of Mexico is off of Florida and this fishery is monitored and enforced by the FWC. Thus, development of a fishery off other Gulf states seems unlikely.

The biological benefits of **Alternative 2** would be expected to be less than **Alternative 1 (No Action)**. Furthermore, adoption of **Alternative 2** would be contrary to the South Atlantic Council's intent stated in Amendment 3 to the Coral FMP of preventing expansion of octocoral harvest and ensuring essential fish habitat in the EEZ is protected. Essential Fish Habitat (EFH) is designated for octocorals, a designation that would be withdrawn if they are removed from the management unit.

Current management of the octocoral fishery by FWC would be expected to continue and while there could be an increase in the harvest of octocorals, it would be unlikely. The market for octocorals is demand driven and there is not likely to be a significant increase in demand. Although the FWC could adopt management of octocorals off of Florida, under **Alternative 2** there would be no protection of the resource in federal waters off of Georgia, South Carolina, and North Carolina.

Preferred Alternative 3 would revise the fishery management unit to include octocorals only off Georgia, North Carolina, and South Carolina. Octocorals off of Florida would be removed from the FMP and would result in no federal management. As explained in the description of **Alternative 1**, although octocoral harvest is managed under the South Atlantic Council's Coral FMP and subsequent amendments, the FWC is responsible for most of the management, implementation and enforcement of regulations because the majority of the harvest occurs in state waters. In a letter dated, April 11, 2011, the FWC describes management measures it will implement with regards to octocorals if the South Atlantic Council proceeds with **Preferred Alternative 3** (**Appendix M**). The FWC intends to extend Florida octocoral regulations into federal waters off of Florida, establish an annual quota for allowable octocoral harvest in state and federal waters off of Florida, and prohibit harvest of octocorals north of Cape Canaveral, Florida and in the Coral habitat areas of particular concern (HAPC) adjacent to Florida waters.

National Standard 3 (NS 3) of the Magnuson-Stevens Act states that, "To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination." The NS 3 guidelines provide the basis for a fishery management unit to be identified around a geographic area (50 C.F.R. § 600.320(d)(2)). In the case of **Preferred Alternative 3**, alternative management exists in under FWC's Marine Life Fishery Program, and the state

has indicated via letter of intent (**Appendix M**) additional management measures they plan to implement for the octocoral fishery in Florida. **Preferred Alternative 3** would allow the South Atlantic Council to remove management for octocorals off Florida where management already exists, a modification that also considers efficiency in the utilization of resources (50 C.F.R. National Standard 5). National Standard 5 (NS 5) guidelines state: "Given a set of objectives for the fishery, an FMP should contain management measures that result in as efficient a fishery as is practicable or desirable (50 C.F.R. § 600.330 (b))."

The economic and social impacts of the action alternatives are expected to be similar. Due to the increased risk of overfishing octocorals under **Alternative 2**, long-term economic and social benefits are expected to decrease slightly compared to **Alternative 1**. Short-term economic and social benefits could increase if the market demand for octocorals increased. With regards to administrative impacts, neither alternative is expected to result in an increase in impacts. **Alternative 2** and **Preferred Alternative 3** would lessen the administrative burden on the agency as management of these species would either no longer be necessary or would be reduced. However, if the need for federal management of octocorals were to arise in the future, the administrative burden of including them in the FMU could result in a significant administrative burden. Under **Preferred Alternative 3**, if the FWC extends their jurisdiction to cover both state and federal waters, as they are expected to do, no short or long-term changes would be expected with regard to economic effects resulting from this action since Florida would take over management of these areas.

Table 2-1. Summarized comparison of the impacts among alternatives for Action 1.

	Alternative 1	**Alternative 2**	**Alternative 3**
Biological	No new impacts	Slightly negative impacts on the resource in Florida. Negative impacts in Georgia, North Carolina and South Carolina.	No new impacts for octocorals in North Carolina, South Carolina, and Georgia.
Economic	No new impacts	Short-term positive	No new impacts
Social	No new impacts	Short-term positive Long-term negative	Little to no new impacts
Administrative	No new impacts	Reduce administrative burden	Reduce administrative burden

2.2 Action 2. Extend the SAFMC's Fishery Management Unit for octocorals into the Gulf of Mexico Fishery Management Council's area of jurisdiction

Preferred Alternative 1. No Action. Do not extend the FMU for octocorals into the GMFMC's jurisdiction.

Alternative 2. Extend the management boundaries for all octocorals species in the Coral FMP to include the GMFMC jurisdiction.

2.2.1 Comparison of Alternatives

Currently, the quota for octocorals is 50,000 colonies combined in the Gulf of Mexico and South Atlantic EEZ. Harvest of octocorals is prohibited north of Cape Canaveral, Florida. At its October 2010 meeting, the Gulf Council selected a preferred alternative to remove octocorals from their Gulf Coral FMP. This management measure lies within their Generic ACL Amendment. The preferred alternative was selected based upon FWC expressing an interest in managing the fishery in the Gulf EEZ off Florida.

The only harvest of octocorals in the Gulf of Mexico is off of Florida and this fishery is monitored and enforced by FWC. Under **Preferred Alternative 1**, the South Atlantic Council would continue to manage octocorals in the South Atlantic but management of octocorals in the Gulf of Mexico would fall to Florida in state waters and federal waters if they extend their jurisdiction. The preferred alternative under Action 1 would allow the FWC to monitor the octocoral quota in state and federal waters off Florida. This could relieve any difficulties in monitoring and enforcing the joint South Atlantic and Gulf of Mexico federal quota. Under **Preferred Alternative 1**, harvest in any of the other Gulf states could not be controlled if a fishery were to develop, leaving octocoral populations vulnerable to overexploitation. However, octocorals are not as abundant in the other Gulf states as in the Florida Keys (SAFMC & GMFMC 1982). Therefore, development of a fishery for octocorals in other Gulf states does seem unlikely.

Alternative 2 would extend management jurisdiction of octocorals to include the Gulf Council's area of jurisdiction. Under this alternative, the 50,000 colony quota would still apply to octocoral harvest in the Gulf of Mexico and the South Atlantic and would not result in increased negative biological impacts to the resource. However, failure to adopt **Alternative 2** could increase harvest of octocorals if a fishery were to develop in the EEZ outside Florida. Therefore, adoption of **Alternative 2** could prevent negative biological effects from occurring in the future if there is an expansion of octocoral harvest in Gulf states besides Florida. However, as stated previously, development of a fishery for octocorals in other Gulf states does seem unlikely.

Given that there are no impacts on the current harvest of octocoral species as a result of **Preferred Alternatives 1** and **2**, economic and social effects are not expected to change. However, adoption of **Alternative 2** would prevent future exploitation of octocoral species in the EEZ of other Gulf states and therefore, could reduce future economic opportunities. The administrative impacts of **Alternative 2** would increase slightly from those of **Preferred Alternative 1** due to revising regulations, outreach and education.

It is expected that under either alternative the FWC would continue to collect data and monitor the octocoral fishery. **Alternative 2** would allow for octocorals to continue to be managed throughout their range and would allow for future management of octocorals in the Gulf states if the need arises. **Alternative 2** addresses jurisdictional issues but may provide a positive biological impact to the resource by allowing for management throughout their range.

Table 2-2. Summarized comparison of the impacts among alternatives for Action 2.

	Alternative 1	Alternative 2
Biological	Slightly negative impacts	Slightly positive impacts
Economic	Slightly positive impacts	Slightly negative impacts
Social	Slightly positive impacts	Slightly negative impacts
Administrative	No impact	Slight increase in impacts

2.3 Action 3. Modify the Annual Catch Limit (ACL) for octocorals in the South Atlantic

Alternative 1. No Action. Do not modify the existing ACL for octocorals in the South Atlantic (ACL=current 50,000 colony quota for South Atlantic and Gulf of Mexico EEZ).

Alternative 2. Modify the existing ACL in the South Atlantic and Gulf of Mexico (ACL=current 50,000 colony quota for South Atlantic and Gulf of Mexico EEZ) to include State waters.

Preferred Alternative 3. ACL = 0 for octocorals in the EEZ off of NC, SC, and GA.

2.3.1 Comparison of Alternatives

Alternative 1 (No Action) would continue to manage octocorals with the 50,000 colony quota for the EEZ and would not account for landings in state waters. The FWC has implemented compatible regulations and closes the state octocoral fishery when the federal quota is met, however, that quota has never been reached and the state fishery for octocorals has never been closed.

Alternative 2 would include harvest from state waters in the 50,000 colony quota. The quota for the octocoral fishery was implemented in 1990 (Coral FMP; SAFMC & GMFMC 1990) and reporting mechanisms have been established. **Alternative 2** would result in a slightly higher administrative burden due to outreach and education, increased monitoring, and enforcement.

Under **Preferred Alternative 3**, the South Atlantic Council would set the ACL for octocorals in the revised FMU (Action 1) equal to zero. Functionally, this would not have any impact on the active octocoral harvesters as there has been a prohibition on octocoral harvest north of Florida for 16 years. Under this alternative, management of octocorals off Florida would continue to be managed by the FWC. Because there are no landings of octocorals occurring in federal waters north of Florida, and harvest of octocorals are

prohibited north of Cape Canaveral, FL, the **Preferred Alternative 3** (ACL = 0) is not expected to result in any negative economic effects.

Landings in state and federal waters have never exceeded the **Alternative 2** proposed ACL of 50,000 colonies and therefore there are no expected short-term economic losses to fishermen related to implementation of the 50,000 quota as the ACL. However, there could be an economic loss suffered by fishermen who have made investments toward expanding harvest operations in the future. Because there are no landings of octocorals occurring in federal waters north of Florida, and harvest of octocorals are prohibited north of Cape Canaveral, Florida, the **Preferred Alternative 3** (ACL = 0) is not expected to result in any negative economic effects.

In regards to Florida, **Alternative 1**, **Alternative 2**, and **Preferred Alternative 3** would have little or no social effects as long as the FWC assumes management of octocorals and continues the same level of octocoral protection. For Georgia, South Carolina, and North Carolina, which under Action 1 would be the EEZs subject to the ACL set in this action, **Alternative 1**, **Alternative 2** and **Preferred Alternative 3** would likely result in no negative social impacts on harvesters (and affiliated dealers, communities, and consumers) because octocoral harvest is prohibited north of Cape Canaveral, Florida. Overall, **Preferred Alternative 3** would likely lead to long-term social benefits due to maximum protection (ACL=0) of octocorals in the EEZs of Georgia, South Carolina, and North Carolina.

Specifying an ACL alone would not increase the administrative burden over the status-quo. However, the monitoring and documentation needed to track the ACL can potentially result in a need for additional cost and personnel resources if a monitoring mechanism is not already in place.

Table 2-3. Summarized comparison of the impacts among alternatives for Action 3.

	Alternative 1	**Alternative 2**	**Alternative 3**
Biological	No impact	Positive impact to the resource	No impact from status quo
Economic	No impact	Long-term positive impacts	No impact
Social	No impact	Long-term positive impacts	No impact
Administrative	No impact	Slight increase in impacts	No impact

2.4 Action 4. Modify management of Special Management Zones (SMZs) off South Carolina

Alternative 1. No Action. Do not modify the current management of SMZs off South Carolina.

Preferred Alternative 2. Limit harvest and possession of snapper grouper species (with the use of all non-prohibited fishing gear) in SMZs off South Carolina to the recreational bag limit.

Preferred Alternative 3. Limit harvest and possession of coastal migratory pelagic species (with the use of all non-prohibited fishing gear) in SMZs off South Carolina to the recreational bag limit.

Alternative 4. Prohibit use of hand spear and spear guns in SMZs off South Carolina.

2.4.1 Comparison of Alternatives

In the EEZ off South Carolina, almost all of the artificial reefs (**Figure 4-2**, and **Figure 4-3**) are managed as special management zones (SMZs) under the Snapper Grouper FMP to protect these relatively small reef communities from the effects of overly-efficient fishing practices. The South Atlantic Council has designated SMZs as Essential Fish Habitat – Habitat Areas of Particular Concern (EFH-HAPC) (Comprehensive EFH Amendment, 1998b).

Recreational constituents and the South Carolina Department of Natural Resources (SCDNR) have voiced concerns over the presence of commercial snapper grouper and coastal migratory pelagic fishing vessels operating on SMZs (**Appendix H**). Specifically, SCDNR indicates the use of conventional spearguns by commercial fishermen to harvest fish on these sites might be harmful to the reef fish populations and is not in keeping with the intended purpose of the SMZs outlined in Snapper Grouper Regulatory Amendment 7.

Alternative 4 would prohibit the use of spearfishing gear within the SMZs, which may provide a slight positive impact to the resource. Spearfishing allows fishermen to more effectively select for larger individuals within target species populations (Sadovy 1994; Meyer 2007; Lloret et al. 2008). Spearfishing is considered to be an efficient harvesting activity that can significantly alter abundance and size structure of target species toward fewer and smaller fish by selective removal of larger individual fish. The removal of larger individual fish of the target species leaves behind smaller individuals to spawn. Over time this can decrease the size and age at sexual maturity and decrease the average size of the population (Sluka and Sullivan 1998; Chapman and Kramer 1999; Matos-Caraballo et al. 2006; Lloret et al. 2008).

The major recreational species targeted in the SMZs include Atlantic spadefish, black sea bass, flounder, king mackerel, sharks, and Spanish mackerel. However, little information on the level of commercial fishing exists in the SMZs off South Carolina and therefore, the

economic effects of **Preferred Alternative 2** and **Preferred Alternative 3** cannot be quantified at this time. It is expected that modifying management of the SMZs to restrict commercial fishing effort to the bag limit could possibly reduce the amount of harvest in the area and may have a positive biological impact on the species regularly targeted by commercial fishermen.

Both **Preferred Alternative 2** and **Preferred Alternative 3** would be expected to result in small reductions in ex-vessel revenues to commercial fishermen, though some mitigation of these reductions could occur as a result of fishing in other areas. At the same time, **Preferred Alternative 2** and **Preferred Alternative 3** would be expected to result in increased economic benefits to recreational fishermen as a result of allocation of the harvest that would otherwise be taken by commercial fishermen to recreational fishermen. Additional economic benefits would be expected to result from healthier and more sustainable populations at these sites over the long term. The economic effect of **Alternative 4** on the recreational fishery of South Carolina would be expected to be significant. However, the expected adverse economic effects cannot be quantified with available data. Also, if **Alternative 4** is implemented, recreational divers may decide to use other gear in the SMZs or fish outside the SMZs. Therefore, any estimate of losses due to **Alternative 4** would likely be an over estimate of actual losses.

Preferred Alternative 2 and **Preferred Alternative 3** would "level the playing field" for recreational and commercial fishermen. **Alternative 4** could negatively impact the recreational dive experience, and cause a decline in charter dive trips.

Under the **No Action Alternative**, the administrative impacts will not increase. Administrative impacts associated with **Alternatives 2-4** are expected to increase. Administrative impacts may take the form of preparation of regulations, education and outreach materials, and law enforcement.

Table 2-4. Summarized comparison of the impacts among alternatives for Action 4.

	Alternative 1	**Alternative 2**	**Alternative 3**	**Alternative 4**
Biological	Possible negative impact	Possible positive impact	Possible positive impact	Possible positive impact
Economic	Possible negative impact	Long-term positive impacts	Long-term positive impacts	Long-term positive impacts
Social	Possible negative impact	Long-term positive impacts	Long-term positive impacts	Long-term positive impacts
Administrative	No impact	Slight increase in impacts	Slight increase in impacts	Slight increase in impacts

2.5 Action 5. Modify Sea Turtle Release Gear Requirements for the Snapper Grouper Fishery

Alternative 1. No Action. Maintain current sea turtle and smalltooth sawfish release gear requirements for the Snapper grouper fishery in federal waters of the South Atlantic. Currently, required gear (regardless of freeboard height) includes:

- a long-handled line clipper or cutter,
- a long-handled dehooker for ingested hooks,
- a long-handled dehooker for external hooks,
- a long-handled device to pull an "inverted V",
- a dipnet,
- a tire (or other comparable cushioned, elevated surface that immobilizes boated sea turtles),
- a short-handled dehooker for ingested hooks,
- a short-handled dehooker for external hooks,
- long-nose or needle-nose pliers,
- bolt cutters,
- monofilament line cutters, and
- at least two types of mouth openers/mouth gags.

This equipment must meet the specifications described in 50 CFR 635.21(c)(5)(i)(A-L) with the following modification: any other comparable, cushioned, elevated surface that allows boated sea turtles to be immobilized, may be used as an alternative to the requirement in 50 CFR 635.21(c)(5)(i)(F) to have a tire on board.

Alternative 2. Require all federally-permitted hook-and-line vessels with no longline gear onboard to have and use a tool capable of cutting the fishing line and a tool capable of removing a hook from a sea turtle or smalltooth sawfish. Fishermen would still be required to comply with all current sea turtle and smalltooth sawfish release guidelines.

Alternative 3. Require all sea turtle and smalltooth sawfish release gear listed under **Alternative 1 (No Action)** for federally-permitted snapper grouper vessels using longline gear, and require [insert specific sea turtle release gear] for federally- permitted vessels fishing with hook-and-line gear.

Preferred Alternative 4. Modify sea turtle and smalltooth sawfish release gear based on freeboard height. Fishermen would still be required to comply with all current sea turtle and smalltooth sawfish release guidelines. The design specifications of required gear and the handling and release techniques employed must comply with those described in the NOAA Fisheries Service document entitled "Careful Release Protocols for Sea Turtle Release with Minimal Injury." NOTE: **Preferred Alternative 4** is recommended by the Southeast Region's Office of Protected Resources Division as the minimum requirement necessary to remain in compliance with the biological opinion.

Preferred Sub-Alternative 4a. Vessels with freeboard height of 4 feet or less would be required to carry and use:

- a short-handled dehooker for ingested hooks; or a dehooker for ingested and a dehooker for external hooks,
- long-nose or needle-nose pliers,
- bolt-cutters,
- mono-filament line cutters,
- cushion/support device (i.e., boat cushion),
- a dipnet,
- at least two types of mouth openers/mouth gags

Preferred Sub-Alternative 4b. Vessels with freeboard height greater than 4 feet (and/or using longline gear) would be required to carry and use:

- a long-handled line cutter,
- a long-handled dehooker for ingested hooks; or a dehooker for ingested and a dehooker for external hooks,
- a long-handled device to pull an "inverted V",
- a dipnet,
- cushion/support device (i.e., boat cushion),
- a short-handled dehooker for ingested hooks; or a dehooker for ingested and a dehooker for external hooks,
- long-nose or needle-nose pliers,
- bolt cutters,
- monofilament line cutters, and
- at least two types of mouth openers/mouth gags.

Alternative 5. Modify the design specifications of the current sea turtle and smalltooth sawfish release gear equipment for all federally-permitted, non-longline, snapper grouper vessels with hook-and-line gear on board to match the specifications described in the NOAA Fisheries Service document entitled "Careful Release Protocols for Sea Turtle Release with Minimal Injury." (See **Appendix K**)

South Atlantic Council may select one or more sub-alternatives. Choosing additional sub-alternatives would be especially beneficial for species conservation, but not required to remain in compliance with the biological opinion.

Sub-Alternative 5a. Require all federally permitted non-longline snapper grouper vessels with hook-and-line gear on board (see **Appendix K**) for specification on each gear type):

- a short-handled dehooker for ingested hooks, or a short-handled dehooker for external hooks,
- cushion/support device (i.e., standard automobile tire or boat cushion)
- long-nose or needle-nose pliers,
- bolt-cutters,
- mono-filament line cutters,
- a dipnet,

- at least two types of mouth openers/mouth gags.

Sub-Alternative 5b. Also require:

- a long-handled dehooker for ingested hooks, or a long-handled dehooker for external hooks,

Sub-Alternative 5c. Also require:

- a long-handled line clipper or cutter,

Sub-Alternative 5d. Also require:

- a long-handled device to pull an "inverted V"

2.5.1 Comparison of Alternatives

The current sea turtle and smalltooth sawfish release gear requirements in Amendment 15B were developed to satisfy requirements of the Endangered Species Act (ESA) biological opinion on the snapper grouper fishery. The biological opinion directed the South Atlantic Council to implement sea turtle and smalltooth sawfish release gear requirements, and required the implementation of safe handling protocols for sea turtles and smalltooth sawfish, among other things. The biological opinion required that the South Atlantic Council consider the sea turtle and smalltooth sawfish release gear requirements in place for the Highly Migratory Species (HMS) fisheries, and at a minimum, implement sea turtle and smalltooth sawfish release gear requirements similar to those for the Gulf of Mexico reef fish fishery (NMFS, 2006). The Gulf of Mexico reef fish fishery requires the dehooking and disentanglement gear currently used in the HMS longline fisheries for vessels with freeboard heights greater than 4 feet (**Appendix J**). Vessels with freeboard heights of 4 feet or less are also required the carry HMS dehooking and disentanglement gears, with the exception that only short-handled equipment is mandatory. The South Atlantic Council ultimately chose to require the same sea turtle and smalltooth sawfish release gear required in the HMS fisheries, making no distinction for vessel freeboard height.

The HMS pelagic longline fishery was the first to require sea turtle and smalltooth sawfish release gear in the Atlantic, and the release equipment developed was originally designed to handle the heavier tackle used in this fishery. As snapper grouper fishermen began using the dehooking and disentanglement gears required in Amendment 15B, the effectiveness and necessity of using these "heavy-duty" tools with lighter snapper grouper tackle was called into question. Therefore, the South Atlantic Council has been asked to consider developing an action that would re-address and possibly modify sea turtle and smalltooth sawfish release gear requirements for the snapper grouper fishery.

Alternative 1 (No Action) would maintain the current sea turtle and smalltooth sawfish release gear requirements for the snapper grouper fishery. Regardless of freeboard height, all vessels using hook-and-line gear would be required to carry the gear listed under **Alternative 1 (No Action)**. The current sea turtle and smalltooth sawfish release gear requirements were established through Snapper Grouper Amendment 15B (SAFMC, 2009) and require all vessels having a South Atlantic Unlimited Snapper grouper Permit, a South Atlantic 225 lb Trip Limit Snapper grouper Permit, or a South Atlantic Charter/Headboat Permit for Snapper grouper, and carrying hook-and-line gear onboard to: (1) post the *Sea Turtle Handling/Release Guidelines* placard inside the wheelhouse, or in any easily viewable area,

if there is no wheelhouse; (2) have a copy of the "Careful Release Protocols for Sea Turtle Release with Minimal Injury" (Protocols) posted inside the wheelhouse, or within a waterproof case in a readily accessible area, and; (3) possess and use sea turtle handling and release gear consistent with the Protocols.

Alternatives 2 and **3** address the concerns raised regarding the modification of sea turtle and smalltooth sawfish release gear specifications for vessels carrying non-longline, hook-and-line gear on board. Under these alternatives, all vessels with longline gear on board will be required to continue carrying all the dehooking and disentanglement gears outlined in **Alternative 1**. Under **Alternative 2** the only tools that would be required for vessels carrying hook-and-line gear that is not longline gear, is a tool capable of cutting fishing line, such as a knife, and tool capable of removing a hook from a sea turtle, such as a pair of pliers. The dehooking and line cutting capabilities of any tool onboard a vessel are subjective, and would therefore be difficult to enforce. **Alternative 2** is similar to regulations currently in place in the Western Pacific (**Appendix L**). This alternative would likely achieve the goal of implementing sea turtle and smalltooth sawfish release equipment more appropriate for the lighter tackle commonly used in the snapper grouper fishery. The potential biological effects are difficult to predict under **Alternative 2** because effectiveness of only certain sea turtle release tools has been tested for longline vessels. However, if the sea turtle release guidelines are followed, and hooks or entangling line are safely removed, there would likely be a biological benefit to the sea turtle. However, because of the requirements of the biological opinion outlining what the South Atlantic Council must consider when implementing sea turtle and smalltooth sawfish release equipment requirements, **Alternative 2** would not be in compliance with the current biological opinion. Selecting **Alternative 2** may require re-initiation of ESA section 7 consultation.

Alternative 3 differs from **Alternative 2** by identifying specific types of sea turtle and smalltooth sawfish release equipment for snapper grouper vessels carrying hook-and-line gear onboard that is not longline gear. **Alternative 3** also maintains the status quo requirement for snapper grouper vessels carrying longline gear onboard. This requirement ensures that vessels with heavier tackle are adequately equipped to release sea turtles that become hooked or entangled in fishing gear.

Preferred Alternative 4 would require different lengths and types of dehooking tools dependent upon the freeboard height of the vessel, which tracks the sea turtle release gear regulations in the Gulf of Mexico reef fishery (**Appendix J**). **Preferred Alternative 4** also offers the option (through **Sub-Alternatives 4a** and **4b**) of tailoring sea turtle and smalltooth sawfish release gear specifications to be more appropriate for use with the lighter tackle of the snapper grouper fishery. **Preferred Sub-Alternatives 4a** and **4b** would allow gear specifications to be changed for vessels with freeboard heights of 4 feet or less, and for vessels with freeboard heights greater than 4 feet. The sea turtle and smalltooth sawfish release equipment requirements for the Gulf of Mexico reef fish fishery allow vessels with freeboard heights of 4 feet or less to carry a truncated suite of equipment. Those vessels are only required to carry short-handled tools, not both short- and long-handled equipment. However, the Gulf of Mexico reef fish fishery regulations still require the use of release

equipment with design specifications that match those originally developed for use in the HMS longline fisheries. **Preferred Alternative 4** references the sea turtle release gear design specifications currently found in the NOAA Fisheries Service document entitled "Careful Release Protocols for Sea Turtle Release with Minimal Injury" (**Appendix K**). Those specifications now include a wider range of design parameters, which should be appropriate for the lighter tackle used in the snapper grouper fishery.

Alternative 5 would modify the gear types currently required for all federally-permitted non-longline snapper grouper vessels with hook-and-line gear on board, without consideration of vessel freeboard height. As with **Preferred Alternative 4** and its sub-alternatives, all the sea turtle release gear discussed in this alternative would be required to meet the new design specifications outlined in the NOAA Fisheries Service document entitled "Careful Release Protocols for Sea Turtle Release with Minimal Injury (**Appendix K**).

The alternatives of this action have been developed to address the concern that heavy duty tools are ineffective and unnecessary, while ensuring the fishery remains in compliance with the biological opinion. **Sub-alternative 5a** would require a minimum set of release equipment more appropriate for the smaller tackle used in the snapper grouper hook-and-line fishery. The pieces of equipment listed were selected to match those currently required by the Gulf of Mexico reef fish fishery for vessels with freeboard heights of 4 feet or less. The equipment in this alternative ensures that even if a minimum suite of equipment is selected, the fishery will remain in compliance with the biological opinion. Choosing additional sub-alternatives (i.e., in addition to **Sub-Alternative 5a**) would be especially beneficial for species conservation, but is not required to remain in compliance with the biological opinion.

Biological gains may be realized with the use of release gear more appropriate to the vessel. **Alternatives 2** and **3** attempt to better match gear with the vessel and are likely to yield greater biological and economic benefits than **Alternative 1**. There are no release gear expenses for those already participating in the fishery since all of the gear required under **Preferred Alternatives 4a** and **4b** is already required under **Alternative 1 (No Action)**. However, under **Preferred Alternatives 4a** and **4b**, vessels will be required to carry less gear. This will free up more space onboard the vessels.

Alternative 5 would modify the gear requirements under **Alternative 1**. **Alternatives 5a-5d** would require gear already possessed by fishermen and listed under **Alternative 1**, but smaller sizes of the same required gear. Therefore, no negative economic effects would be expected as a result of the **Alternative 5** sub-alternatives unless fishermen purchased the smaller gears identified in the sub-alternatives.

Alternative 2, Alternative 3, Preferred Alternative 4, and **Alternative 5** allow for variation in release gear requirements depending on vessel size and fishing gear. The more appropriately matched the release gear requirements, the lower the additional costs for smaller operations. This would be expected to result in positive social benefits by minimizing costs for release gear for new entrants.

Table 2-5. Summarized comparison of the impacts among alternatives for Action 5.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Biological	Neutral impacts	Not in compliance with current biological opinion	Varying compliance with biological opinion	Overall positive impacts	Overall positive impacts
Economic	Overall positive impacts	Overall positive impacts	Overall positive impacts	Long-term positive impacts	Long-term positive impacts
Social	Overall negative impacts	Overall positive impacts	Overall positive impacts	Overall positive impacts	Overall positive impacts
Administrative	No impact	Slight increase in impacts	Slight increase in impacts	Slight increase in impacts	Slight increase in impacts

2.6 Action 6. Amend the Snapper Grouper Fishery Management Plan (FMP) to designate new EFH-HAPCs

Alternative 1. No Action. Do not amend the Snapper Grouper FMP to designate new Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs).

Preferred Alternative 2. Amend the Snapper Grouper FMP to designate one or more of the following as EFH-HAPCs.

Sub-alternative 2a. Designate 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.

Sub-alternative 2b. Designate 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.

Preferred Alternative 3. Designate 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
- East Hump MPA

2.6.1 Comparison of Alternatives

EFH and EFH-HAPCs were established for snapper grouper through Amendment 10 to the Snapper Grouper FMP as part of the Comprehensive EFH Amendment (SAFMC 1998b) and are presented in Section 3.4.2. **Alternative 1 (No Action)** would not add an area highlighting the importance of golden tilefish and blueline tilefish or the value of emphasizing the value of the habitat in the deepwater MPAs established in Snapper Grouper Amendment 14 (SAFMC 2007). **Preferred Alternative 2** addresses an oversight in the initial designation of Snapper Grouper EFH through the Comprehensive EFH Amendment (SAFMC 1998b) where the Habitat Plan describes in detail tilefish habitat and proposes the general distribution between 100 and 300 meters as an area considered to be an EFH-HAPC for tilefish. While considered EFH, the area was not included in the proposed list of EFH-HAPCs. **Alternative 2a** for golden tilefish and **Alternative 2b** for blueline tilefish propose respective detailed descriptions for EFH-HAPCs. **Preferred Alternative 3** would designate previously specified (Snapper Grouper Amendment 14) deepwater MPAs as EFH-HAPCs. This alternative is intended to protect these MPAs as a unique habitat complex and require enhanced EFH consultations pertaining to non-fishing activities that could potentially impact these protected habitats.

The designation of additional EFH-HAPCs for snapper grouper species would not result in direct impacts to the biological resources of the west-central Atlantic Ocean. Rather, the EFH-HAPC designation under this action would provide a future opportunity for the South Atlantic Council to establish regulations to protect EFH from fishing activities in the EEZ and to review and recommend EFH conservation measures to protect surface waters from non-fishing activities which are undertaken, authorized, or funded by federal agencies. Similarly, designation of additional snapper grouper EFH-HAPCs would require federal agencies to consult with NOAA Fisheries Service on activities which may adversely affect that habitat. Designation of additional EFH-HAPCs will require the South Atlantic Council to consider all operations or actions that might interact with or affect the EFH-HAPC, and may trigger a consultation for any activity that may affect the habitat. This consultation process associated with EFH-HAPCs may result in increased economic, social and administrative impacts. The direct effects of additional regulatory consideration would be the financial costs of a lengthy regulatory process. The nature and extent of those impacts are unknown and will undoubtedly vary depending upon the individual and/or agency and the actions to be taken within the designated EFH-HAPCs.

Assuming the areas are appropriate to the resource, both **Preferred Alternatives 2** and **3** would be expected to result in greater protection of the resource than **Alternative 1 (No Action)** and provide for increased long-term economic benefits. There will be few social impacts from establishing EFH-HAPCs and would most likely come from future actions that are associated with such designations. Designation of new EFH and EFH-HAPC will require consideration of all operations or actions that might interact with or affect the EFH, and may trigger a consultation for any activity that may affect the habitat.

Table 2-6. Summarized comparison of the impacts among alternatives for Action 6.

	Alternative 1	Alternative 2a	Alternative 2b	Alternative 3
Biological	Overall negative impacts	Overall positive impacts	Overall positive impacts	Overall positive impacts
Economic	Neutral impacts	Overall positive impacts	Overall positive impacts	Overall positive impacts
Social	Overall negative impacts	Overall positive impacts	Overall positive impacts	Overall positive impacts
Administrative	Neutral impacts	Overall negative impacts	Overall negative impacts	Overall negative impacts

2.7 Action 7. Amend the Coral, Coral Reefs and Live/Hardbottom Habitat Fishery Management Plan (Coral FMP) to designate new EFH-HAPCs

Alternative 1. No Action. Do not amend the Coral FMP to designate new Essential Fish Habitat – Habitat Areas of Particular Concern (EFH-HAPCs).

Preferred Alternative 2. Amend the Coral FMP to designate the following Deepwater Coral HAPCs as designated in Comprehensive Ecosystem-Based Amendment 1 as EFH-HAPCs: Cape Lookout Coral HAPC, Cape Fear Coral HAPC, Blake Ridge Diapir Coral HAPC, Stetson-Miami Terrace Coral HAPC, Pourtalés Terrace Coral HAPC.

2.7.1 Comparison of Alternatives

EFH and EFH-HAPCs for corals were established through Amendment 4 to the Coral FMP as part of the Comprehensive EFH Amendment (SAFMC 1998b) and are presented in Section 3.4.1. **Alternative 1 (No Action)** would not propose additional EFH-HAPCs intended to aid in the conservation of coral and live bottom habitat especially when addressing policy or permit activities associated with non-fishing activities. However, in July 2010, a final rule was published establishing deepwater Coral HAPCs in the South Atlantic region which offers protection from bottom damaging fishing activities (SAFMC 2009b). **Preferred Alternative 2** proposes to further emphasize the importance of these protected deepwater coral ecosystems by designating them as EFH-HAPCs. While habitats within the boundaries of the coral HAPCs are essential fish habitat for other managed species, designation of the entire area as an EFH-HAPC would require enhanced EFH consultation pertaining to non-fishing activities that may negatively impact the deepwater Coral HAPCs.

The designation of additional EFH-HAPCs for the Coral FMP would not result in direct impacts to the biological resources of the South Atlantic. Rather, the EFH-HAPC designation under this action would provide a future opportunity for the South Atlantic Council to establish regulations to protect EFH from fishing activities in the EEZ and to review and recommend EFH conservation measures to protect surface waters from non-fishing activities which are undertaken, authorized, or funded by federal agencies. Similarly, designation of additional EFH-HAPCs would require federal agencies to consult with NMFS on activities which may adversely affect that habitat. Designation of EFH-HAPCs will

require the South Atlantic Council to consider all operations or actions that might interact with or affect the EFH-HAPC, and may trigger a consultation for any activity that may affect the habitat. This consultation process associated with EFH-HAPCs may result in increased economic, social and administrative impacts. The direct effects of additional regulatory consideration would be the financial costs of a lengthy regulatory process. The nature and extent of those impacts are unknown and will undoubtedly vary depending upon the individual and/or agency and the actions to be taken within the designated EFH-HAPCs.

Assuming the area is appropriate to the resource, **Preferred Alternative 2** would be expected to result in greater protection of the resource than **Alternative 1 (No Action)** and provide for increased long-term economic benefits over **Alternative 1 (No Action)**. There will be few social impacts from establishing EFH-HAPCs and would most likely come from future actions that are associated with such designations. Designation of new EFH and EFH-HAPC would require consideration of all operations or actions that might interact with or affect the EFH, and may trigger a consultation for any activity that may affect the habitat.

Table 2-7. Summarized comparison of the impacts among alternatives for Action 7.

	Alternative 1	**Alternative 2**
Biological	Overall negative impacts	Overall positive impacts
Economic	Neutral impacts	Overall positive impacts
Social	Overall negative impacts	Overall positive impacts
Administrative	Neutral impacts	Overall negative impacts

2.8 Action 8. Amend the Fishery Management Plan (FMP) for Pelagic *Sargassum* Habitat to designate EFH

Alternative 1. No Action. Do not amend the *Sargassum* FMP to designate Essential Fish Habitat (EFH).

Alternative 2. Amend the *Sargassum* FMP to designate the top ten meters of the water column in the South Atlantic EEZ as EFH for pelagic *Sargassum*.

Preferred Alternative 3. Amend the *Sargassum* FMP to designate the top ten meters of the water column in the South Atlantic EEZ bounded by the Gulfstream, as EFH for pelagic *Sargassum*.

2.8.1 Comparison of Alternatives

The FMP for Pelagic *Sargassum* Habitat of the South Atlantic Region (SAFMC 2002b) was approved in 2003. However, the provisions proposing the designation of EFH and EFH-HAPCs for pelagic *Sargassum* were disapproved because they did not meet the definition of

EFH and EFH-HAPCs. Pursuant to the Magnuson-Stevens Act, all managed species must have EFH designated and where information exists consider establishment of EFH-HAPCs. In addition, actions to reduce the impact of fishing on EFH must be evaluated and if needed, non-fishing threats identified. Regulations in the *Sargassum* FMP prohibit harvest in the majority of the South Atlantic waters and establish a restrictive 5,000 annual quota, address the need to reduce or eliminate the impact of fishing activities on *Sargassum.*

Alternative 1 (No Action) would not specify EFH for *Sargassum* and would not be in compliance with the EFH Final Rule. **Alternative 2** proposes an EFH designation that includes the top ten meters of the water column where it occurs in the South Atlantic. **Preferred Alternative 3** proposes a smaller EFH designation and includes the top ten meters of the water column in the South Atlantic with the bounds of the Gulf Stream being the most Eastern boundary. The Gulf Stream is the most significant oceanographic feature supporting *Sargassum* species occurrence, distribution and transport. The Gulf Stream is already designated as EFH for dolphin and wahoo, coastal migratory pelagics, spiny lobster, rock shrimp and golden crab.

The EFH designation under this action would provide a future opportunity for the South Atlantic Council to establish regulations to protect EFH from fishing activities in the EEZ and to review and recommend EFH conservation measures to protect surface waters from non-fishing activities which are undertaken, authorized, or funded by federal agencies. Similarly, designation of *Sargassum* EFH would require federal agencies to consult with NOAA Fisheries Service on activities which may adversely affect that habitat. Designation of EFH will require the South Atlantic Council to consider all operations or actions that might interact with or affect the EFH, and may trigger a consultation for any activity that may affect the habitat. This consultation process associated with EFH may result in increased economic, social and administrative impacts. The direct effects of additional regulatory consideration would be the financial costs of a lengthy regulatory process. The nature and extent of those impacts are unknown and will undoubtedly vary depending upon the individual and/or agency and the actions to be taken and expected impacts on designated EFH. However, considering the Gulf Stream is already EFH for a number of managed species, it is likely that *Sargassum* would be included as one of the potentially impacted species and administrative burden associated with EFH consultation would not be anticipated to increase.

Assuming the area is appropriate to the resource, **Preferred Alternative 3** would be expected to result in greater protection of the resource than **Alternative 1 (No Action)** and **Alternative 2** and is expected to increase long-term economic benefits compared **Alternative 1 (No Action)** and **Alternative 2**. There would be few social impacts from establishing EFH-HAPCs and would most likely come from future actions that are associated with such designations. Designation of new EFH and EFH-HAPC would require consideration of all operations or actions that might interact with or affect the EFH, and may trigger a consultation for any activity that may affect the habitat.

Table 2-8. Summarized comparison of the impacts among alternatives for Action 8.

	Alternative 1	**Alternative 2**	**Alternative 3**
Biological	Overall negative impacts	Overall positive impacts	Overall positive impacts
Economic	Overall negative impacts	Neutral impacts	Overall positive impacts
Social	Overall negative impacts	Overall positive impacts	Overall positive impacts
Administrative	Overall positive impacts	Overall negative impacts	Neutral impacts

3 Affected Environment

3.1 Habitat

3.1.1 Description and distribution of Coral, Coral Reefs and Live Hard Bottom Habitat

It is commonly known that stony corals are the main builders of the reef framework in tropical reefs and also major occupiers of space in such habitats. However, in certain coral reef habitats, non-stony coral anthozoans, typically zooanthids and octocorals, occupy comparable expanses of substratum and are functionally comparable to reef-building corals (Fautin 1988). Coral reef environments also have vast expanses of solid substrata heavily populated by epibiotic micro- and algoflora (Sorokin 1973). The physical and biological characteristics of a habitat are fundamental to determining which organisms live there. Octocorals are functionally as important as stony corals for habitat topographic complexity.

North Carolina to Cape Canaveral

Coral communities on the outer continental shelf proper are characterized by patches of low-relief hard bottoms also referred to as "live bottom" habitats. Perkins et al. (1997) estimated the distribution and areal amount of hardbottom for the Florida/Georgia border to Jupiter Inlet. These hardbottom habitats are often dominated by octocorals. Bayer (1961) stated that the shelf octocoral fauna from the East Coast of Florida north of Cape Canaveral is indistinguishable from the fauna from Georgia and the Carolinas. Reports from North Carolina (Menzies et al. 1966; Cerame-Vivas and Gray 1966), South Carolina (Powles and Barans 1979), and Georgia (Reed 1978, personal communication) appear to confirm this conclusion for both octocorals and scleractinians.

Southeast Florida Coast (Palm Beach to Fowey Rocks)

South of 27° North latitude to near Miami, the continental shelf narrows to 3 to 5 km (1.6 to 2.7 nm) and the warm waters of the Florida current become the most dominant hydrographic feature (Lee and McGuire 1972). Thus, in the vicinity of Palm Beach, Florida, a diverse reef community develops. The coral communities in the southeast Florida region are tropical in character, zoogeographically similar to that of the Florida Keys but less well developed than the majority of the Florida reef tract.

Much of the underlying substrate in this region is a Holocene elkhorn coral, *Acropora palmata*, and staghorn coral, *A. cervicornis*, relic reef which lies 15 to 30 m (50 to 100 ft.) below present sea level. The reef has not been actively accreting for the last 8,000 years (Lighty et al. 1977; Banks et al. 2007). The system of coral communities from Palm Beach County to Miami-Dade County can be characterized as a series of discontinuous reef lines that parallel the shoreline. As an example, in Broward County there are generally three lines of reef (terraces); inner reef crests in 3 to 5 m, middle reef crests in 7 to 9 m, and the outer reef in16 to 23 m water depths (Banks et al. 2007; Walker et al. 2008). Nearshore of the Inner Reef is a series of nearshore ridges (Moyer 2003; Banks et al. 2007; Walker et al. 2008.

The coral community found within this region is generally dominated by gorgonian corals (Order Alcyonacea). A number of earlier studies have provided limited descriptions of the reef community in this region. Goldberg (1973a and b) has characterized the deeper zones of this community (20 to 30 m; 66 to 100 ft) by the presence of the gorgonian *Iciligorgia schrammi*. Wheaton and Jaap (1976) and Courtenay et al. (1975) discussed reef zonation off Palm Beach and Miami Beach, respectively. Wheaton described the octocoral fauna on the offshore reef terrace from Palm Beach County to Looe Key (Wheaton 1987). Blair and Flynn (1989) observed coral community structure off Miami. Goldberg (1973a) reported an average octocoral density off Palm Beach County of 25 colonies/m^2.

Coral, coral reefs, and coral community habitat status is mostly recorded as part of monitoring efforts (Gilliam et al. 2007a, b) originated as impact and mitigation studies from adverse environmental impacts to specific sites (dredge insults, ship groundings, pipeline and cable deployments, and beach renourishment). Beginning in 1997, in response to beach renourishment efforts in Broward County, annual collection of environmental data (sedimentation quantities and rates and limited temperature measurements), and coral (stony corals and gorgonians), sponge, and fish abundance/cover data was conducted at 18 sites. In 2000 five new sites were added and in 2003 two additional sites were added for a total 25 sites (Gilliam et al. 2007a). In 2003, the Florida Department of Environmental Protection (FDEP) was awarded funding for a coral reef monitoring along the southeast Florida coast. Florida DEP contracted this work *en toto* to the Florida Fish and Wildlife Conservation Commission's Fish and Wildlife Research Institute (FWC-FWRI) who is working with Nova Southeastern University's National Coral Reef Institute. Ten sites were installed: three in Miami-Dade County, four in Broward County, and three in Palm Beach County (Gilliam et al. 2007b). Three additional sites were installed in Martin County in 2006. The Southeast Florida Coral Reef Evaluation and Monitoring Project (SECREMP) is an extension of the Florida Keys Coral Reef Evaluation and Monitoring Project (CREMP) which utilizes the same methods (Gilliam et al. 2006).

Octocorals are more abundant that stony corals in this region. Density can approach 20 colonies/m^2 (Gilliam et al. 2007a) with coverage of 20% (Gilliam et al. 2007b). Much less data exist on the species richness due to the difficulty of field identification, but common species include several *Eunicea* species, *Plexaura flexuosa*, *Pseudopterogorgia americana*, and *Muricea muricata*.

Monitoring data have shown that, although some differences were determined between years at some sites, in general stony coral cover on the reefs off Broward County (Gilliam et al. 2007a) has been stable. Regional data collected by the SECREMP project has also shown stability in stony coral and octocoral cover (Gilliam et al. 2007b). SECREMP and CREMP data indicate that southeast Florida reefs generally have reduced stony coral species richness and stony coral cover than the Dry Tortugas or Florida Keys coral reefs. Benthic cover by octocorals is, interestingly, very similar throughout the Florida reef system while southeast Florida reefs appear to have reduced macroalgae cover compared to reefs in the Dry Tortugas and the Florida Keys (Gilliam et al. 2006, Gilliam et al. 2007b).

Florida Keys (Fowey Rocks to the Dry Tortugas)
Coral reefs and coral communities are common within the south Florida coastal ecosystem. Well developed coral reefs similar to those found in the Bahamas and Caribbean occur from Fowey Rocks to Tortugas Banks: 25° 40' – 24° 30'N latitude, 80° 30' – 82° 40'W longitude (Jaap 1984; Jaap and Hallock 1990). The diversity and abundance of octocorals tends to be greatest in patch reefs and offshore deep reefs. Functionally, coral reefs enhance the abundance and variety of life, provide a living breakwater that protects the coast from storm waves, provide economic benefit from fisheries and tourism, and are important education and research resources. Quantitative information dealing with distribution and abundance of gorgonians is available for several back reef areas in the Florida Keys. Opresko (1973) has analyzed gorgonian data for Boca Chita Pass, Soldier Key, and Red Reef. Bagby (1978) studied three sites off Key Largo, Florida, chosen to provide a view of the influence of increasing oceanic conditions. Bagby (1978) found that *Pseudopterogorgia americana* and *P. acerosa* were the most widespread species. In agreement with the conclusions of Opresko (1973), *P. acerosa* was most common inshore, while *P. americana* was more dominant at offshore patch reefs. Equally widespread, but numerically less dominant, were the species double-forked *Plexaurella* (*Plexaurella dichotoma*) and *Plexaura flexuosa*. Two species, *Eunicea succinea* and *Pterogorgia citrina*, were distributed in abundance at both Soldier Key and Nine Kilometer Reef, but not in intermediate areas. *Pseudoplexaura porosa* was dominant on Five Kilometer Reef and black sea rod (*Plexaura homomalla*) was of considerable importance on Red Reef, but neither was prominent elsewhere in the areas studied. *Plexaura flexuosa* and *Pseudopterogorgia americana* dominated the shallow reefs at Long Key, Dry Tortugas (Wheaton, unpublished). Thus, any or all of these species can be found prominently on inshore or offshore reefs, in shallow water or on outer reefs at depths up to 20 m (66 ft). Their relative abundance on a given reef must therefore be interpreted with caution. Shallow patch reefs near the outer reef tract display a number of clear-water indicator species. *Gorgonia ventalina*, *Muriceopsis flavida*, *Briareum asbestinum*, and *Pseudopterogorgia bipinnata* all fall in this category, in decreasing order of consistency (Opresko 1973, Bagby 1978). At four pairs of reefs in Biscayne National Park Wheaton (unpublished) surveyed octocoral abundance and density by transect, species count, and photographic analysts. Octocoral colonies usually comprised more than half of the total coral colonies. The five most abundant species (53.9 percent of total octocorals) were *Plexaura flexuosa*, *P. homomalla*, *Gorgonia ventalina*, *Eunicea succinea*, and *Pseudopterogorgia americana*. Mean numbers of octocoral colonies counted along a 20 m (66 ft) transect of the eight reefs were 102.81 and 155.17 (Wheaton unpublished).

Description and Distribution of Marine Water Column
The following is a description of marine water column habitats presented in the Fishery Ecosystem Plan (SAFMC 2009a). Specific habitats in the water column can best be defined in terms of gradients and physical and biological characteristics, such as temperature, salinity, density, nutrients, light and depth. These "structural" components of the water column environment (Peters and Cross 1985) are not static but change both in time and space. Therefore, there are numerous potentially distinct water column habitats for a broad array of species and life-stages within species.

Winds are important in all layers of the marine water column. Wind stress can alter or reverse the generally southern pattern of flow in the coastal frontal zone, CFZ (Blanton et al. 1999). Winds can also mix and move water masses inshore. In the mid-Atlantic, waters from Gulf Stream intrusions move across the shelf at a rate of approximately 2-3 miles/day (3-5 km/day), and parallel to the coast at a rate of approximately 3-9 miles/day (5-15 km/day) (Hare et al. 1999). Georgian shelf waters flow into the North Carolina Capes region during periods of persistent southwesterly winds, while Virginian coastal waters flow south across Diamond, and occasionally Lookout, shoals during periods of persistent northerly winds (Pietrafesa 1989). Current and wind patterns will have a strong effect on the recruitment and retention of various fish larvae from different offshore areas.

The continental shelf off the southeastern U.S., extending from the Dry Tortugas to Cape Hatteras, encompasses an area in excess of 100,000 km^2 (Menzel 1993). Based on physical oceanography and geomorphology, this environment can be divided into two regions: Dry Tortugas to Cape Canaveral and Cape Canaveral to Cape Hatteras. The break between these two regions is not precise and ranges from West Palm Beach to the Florida-Georgia border depending on the specific data considered. The shelf from the Dry Tortugas to Miami is ~25 km wide and narrows to approximately 5 km off Palm Beach. The shelf then broadens to approximately 120 km off of Georgia and South Carolina before narrowing to 30 km off Cape Hatteras. The Florida Current/Gulf Stream flows along the shelf edge throughout the region. In the southern region, this boundary current dominates the physics of the entire shelf (Lee et al. 1992, 1994). In the northern region, additional physical processes are important and the shelf environment can be subdivided into three oceanographic zones (Atkinson et al. 1985; Menzel 1993). The outer shelf (40-75 m) is influenced primarily by the Gulf Stream and secondarily by winds and tides. On the mid-shelf (20-40 m), the Gulf Stream, winds, and tides almost equally affect the water column. Freshwater runoff, winds, tides and bottom friction influence inner shelf waters (0-20 m).

Several water masses are present in the region. From the Dry Tortugas to Cape Canaveral, the three water types are: Florida Current Water (FCW), waters originating in Florida Bay, and shelf water. Shelf waters off the Florida Keys are an admixture of FCW and waters from Florida Bay (Lee et al. 1992, 1994). From Cape Canaveral to Cape Hatteras, four water masses are found: Gulf Stream Water (GSW), Carolina Capes Water (CCW), Georgia Water (GW) and Virginia Coastal Water (VCW). Virginia Coastal Water enters the region from north of Cape Hatteras. Carolina Capes Water and GW are admixtures of freshwater runoff and GSW (Pietrafesa et al. 1986).

Spatial and temporal variation in the position of the western boundary current has dramatic affects on water column habitats. Variation in the path of the Florida Current near the Dry Tortugas induces formation of the Tortugas Gyre (Lee et al. 1992, 1994). This cyclonic eddy has horizontal dimensions on the order of 100 km and may persist in the vicinity of the Florida Keys for several months. The Pourtalés Gyre, which has been found to the east, is formed when the Tortugas Gyres moves eastward along the shelf. Upwelling occurs in the center of these gyres, thereby adding nutrients to the near surface (<100 m) water column.

Wind and input of Florida Bay water also influence the water column structure on the shelf off the Florida Keys (Smith 1994; Wang et al. 1994).

Similarly, further downstream, the Gulf Stream encounters the Charleston Bump, a topographic rise on the upper Blake Ridge. Here the current is often deflected offshore, again resulting in the formation a cold, quasi-permanent cyclonic gyre, and associated upwelling (Brooks and Bane 1978). Along the entire length of the Florida Current and Gulf Stream, cold cyclonic eddies are imbedded in meanders along the western front. Three areas of eddy amplification are known: Downstream of Dry Tortugas, downstream of Jupiter Inlet (27°N to 30°N latitude) ("The Point" or "Amberjack Hole"), and downstream of the Charleston Bump (32°N to 34°N latitude) ("The Charleston Gyre"). Meanders propagate northward (i.e., downstream) as waves. The crests and troughs represent the onshore and offshore positions of the Gulf Stream front. Cross-shelf amplitudes of these waves are on the order 10 to 100 km. Upwelling within meander troughs is the dominant source of "new" nutrients to the southeastern U.S. shelf and supports primary, secondary, and ultimately fisheries production (Yoder 1985; Menzel 1993). Off Cape Hatteras the Gulf Stream turns offshore to the northeast. Here, the confluence of the Gulf Stream, the Western Boundary Under-Current (WBUC), Mid-Atlantic Shelf Water (MASW), Slope Sea Water (SSW), CCW, and VCW create a dynamic and highly productive environment, known as the "Hatteras Corner" or "The Point".

On the continental shelf, offshore projecting shoals at Cape Fear, Cape Lookout and Cape Hatteras affect longshore coastal currents and interact with Gulf Stream intrusions to produce local upwelling (Blanton et al. 1981; Janowitz and Pietrafesa 1982). Shoreward of the Gulf Stream, seasonal horizontal temperature and salinity gradients define the mid-shelf and inner-shelf fronts. In coastal waters, river discharge and estuarine tidal plumes contribute to the water column structure.

3.2 Biological/Ecological Environment

3.2.1 Species Most Impacted by this Amendment

3.2.1.1 Octocorals

Octocorallia (sea fans, sea whips, etc.)

For the purpose of this plan, includes species belonging to the Class Anthozoa, Subclass Octocorallia (soft corals and gorgonians), Order Alcyonacea. Similar to stony corals, octocorals are colonial animals with a polyp as the individual building unit and may contain endosymbiotic algae (zooxanthellae). Unlike stony coral, octocorals do not secret a calcium carbonate skeleton but have a axial skeleton mainly composed of collagen fibers in a proteinaceous matrix. Although octocorals do not contribute to reef framework, they do contribute greatly to reef complexity and diversity.

The hardbottom, coral reef, and coral community habitats within the management area contain a considerable diversity of octocorals. **Table 3-1** lists the distribution of the common octocorals within the management area and includes possible endemic species.

Cairns (1977) published a field guide to the more common gorgonians of the Gulf of Mexico, Caribbean, and Florida. Sanchez and Wirshing (2005) published a field guide to western tropical Atlantic octocorals. Wheaton described the octocoral fauna off southeast Florida in 20-50 meter zones (1987), off Key Largo, in 27-57 m depths (1981), at Looe Key (1988), and at Dry Tortugas (1975, 1989). DeVictor and Morton (2007) recently produced a shallow water octocoral guide for the South Atlantic Bight from Cape Hatteras, NC to Cape Canaveral, FL.

Table 3-1. Common octocoral species from the shallow-water continental shelf regions (less than 200 meter or 660 ft) of the southern United States.

Order	Suborder	Family	Genus species	Distribution
Alcyonacea				
	Scleraxonia			
		Briareidae		
			Briarium asbestinum	2,3,4
		Anthothelidae		
			Icilogorgia schrammi	1,2,3,4
			Anthothela tropicalis	1
			Erythropodium caribaeorum	2,3,4
			**Titanideum frauenteldii*	1,2
	Holaxonia			
		Plexauridae		
			Plexaura homomalla	2,3,4
			Plexaura flexuosa	2,3,4
			Plexaura kuna	2,3,4
			Pseudoplexaura porosa	2,3,4
			Pseudoplexaura flagellosa	3,4
			Pseudoplexaura wagenaari	2,3,4
			**Eunicea palmeri*	3
			Eunicea mammosa	2,3,4
			Eunicea succinea	2,3,4
			Eunicea fusca	1,2,3,4
			Eunicea laciniata	3,4
			Eunicea tourneforti	2,3,4
			Eunicea asperula	2,3,4
			Eunicea clavigera	2,3,4
			**Eunicea knighti*	3
			Eunicea calyculata	2,3,4
			Muriceopsis flavida	2,3,4
			Muriceopsis petila	1,2,3,4
			Plexaurella dichotoma	2,3,4
			Plexaurella nutans	2,3,4
			Plexaurella fusifera	2,3,4
			Plexaurella grisea	3,4
			Muricea muricata	2,3,4
			Muricea atlantica	2,3,4
			Muricea laxa	2,3,4
			Muricea elongata	2,3,4
			**Muricea pendula*	1,2,3,4
	Holaxonia			
		Gorgoniidae		
			**Leptogorgia cardinalis*	2,3,4
			Leptogorgia hebes	1

			Leptogorgia virgulata	1
			Leptogorgia setacea	1
			Leptogorgia eurale	1
			Pseudopterogorgia bipinnata	3,4
			Pseudopterogorgia acerosa	2,3,4
			Pseudopterogorgia elisabethae	3
			Pseudopterogorgia americana	2,3,4
			Pseudopterogorgia rigida	2,3,4
			Pseudopterogorgia kallos	3,4
			Gorgonia ventalina	2,3,4
			Gorgonia flabellum	3,4
			Pterogorgia citrina	2,3,4
			Pterogorgia anceps	2,3,4
			Pterogorgia guadalupensis	3,4

Note: The distribution zones are divided as follows: (1) Atlantic Coast to NE. Florida (South Atlantic Bight); (2) SE. Florida; (3) Florida Keys; (4) Dry Tortugas. * Indicates species with principal distribution within study area (possibly endemic).

Reproduction

Octocorals have both sexual and asexual reproductive modes. The addition of new polyps to a colony occurs through budding of existing polyps. In this way, colonies grow in size through an asexual means of reproduction. In addition, many coral species, particularly branching ones, are also highly clonal in that they can reproduce asexually by fragmentation. That is, individual branches, when broken off from the parent colony, can re-attach to the substrate and form a new, distinct colony. These characteristics greatly complicate the population biology of corals, particularly branching species.

Corals also reproduce sexually, with sperm fertilizing egg, followed by a process of embryonic development into a planula larva. The larvae may survive long periods (i.e., one to a few weeks) floating in the water currents until they settle and metamorphose into a sessile polyp on some hard substrate. Different coral species display different sexual reproduction strategies. Some species have separate sexes while others are hermaphroditic. Some have internal fertilization and retain the developing embryos inside the mother colony to a relatively late stage of development (brooders) while others (broadcast spawners) release their gametes into the water column so that fertilization and the entire larval development phase occurs in an oceanic, highly diluting environment. Among octocorals, another reproductive strategy is surface brooding, where eggs are released passively onto the surface of the colony (Benayahu and Loya 1983, Brazeau and Lasker 1990, Guitiérrez-Rodríguez and Lasker 2004). While sampling female colonies of *Pseudopterogorgia elisabethae*, Guitiérrez-Rodríguez and Lasker (2004) did not find developing embryos or planula inside the polyps, and they suggested that fertilization occurred either internally immediately before the eggs were released or externally on the surface of the maternal colony.

Brooded larvae are often able to settle shortly after release (hence higher recruitment success and lower average dispersal than broadcast spawning species). An advantage of brooding is that the eggs avoid the risk of being advected off of the reef and away from sperm of potential mates (Lasker 2006). Generally, broadcast spawning stony coral species tend to have high longevity, lower recruitment, larger maximum colony size (i.e., K-selected life

history traits). Brooding stony corals are generally more weedy species which do not attain large colony size and hence have limited contribution to reef accretion (Szmant 1986). Such inter-specific differences in the mechanisms of fertilization, dispersal, recruitment, and mortality are likely important in determining the species composition of reef corals in different environments. Such differences reflect the differential allocation of energy to the basic life history functions of growth (rate and density of the skeleton), reproduction (fecundity, mode of larval dispersal, recruitment success), and colony maintenance (intra- and interspecific interactions, competitive ability, regeneration) (Connell 1973, Lang 1973, Bak and Engel 1979, Szmant 1986).

Most broadcast spawning corals release gametes only on a few nights per year. In southeast Florida, most species spawn over a few nights clustered around the full moon in late summer. Spawning synchrony is crucial in order for sessile organisms to accomplish external fertilization. Also, in the context of declining population density as is being observed for many shallow reef corals in the region, fertilization may constitute the major life-history bottleneck as dilution between colonies even few to tens of meters distant may be prohibitive.

Brooding species often release larvae on a lunar cycle over several months or year round. *Porites astreoides*, a brooding stony coral species, releases larvae around the new moon, primarily from April to June in the Florida Keys (McGuire and Szmant1997). However, the brooding season has been reported to be from January to September farther south in Puerto Rico (Szmant 1986). *Favia fragum*, another brooding species, releases larvae monthly year-round (Szmant 1986). Surface brooding has been reported in a few octocoral species found in the management area, including *Briaerium asbestinum* and *Pseudopterogorgia elisabethae* (Guitiérrez-Rodríguez and Lasker 2004).

In either mode of larval development, planula larvae presumably experience considerable mortality (up to 90% or more) from predation or other factors prior to settlement and metamorphosis (Goreau et al. 1981). The selection of appropriate settlement substrate is not well-understood, but for several coral species, chemical cues from crustose coralline algae and microbial biofilms have been shown to induce settlement and metamorphosis (Morse et al. 1994, Morse and Morse 1996, Webster et al. 2004). Settled larvae undergo metamorphosis by generating a calcium carbonate skeleton. The mouth is situated at the upper end, and a ring of tentacles develops around the mouth. After metamorphosis onto appropriate hard substrata, metabolic energy is diverted to colony growth and maintenance. Because newly settled corals barely protrude above the substratum, juveniles need to reach a certain size to reduce damage or mortality from impacts such as grazing, sediment burial, and algal overgrowth (Bak and Elgershuizen 1976, Birkeland 1977, Sammarco 1985). Cary (1914) points out the obvious advantage of young octocorals over stony coral recruits in that their most rapid growth is perpendicular to the substratum, keeping the most active growing part of the colony in a favorable position for resource allocation. Recent studies examining early survivorship of lab cultured *A. palmata* settled onto experimental limestone plates and placed in the field indicate that survivorship is substantially higher than for *Montastraea faveolata*, another broadcast spawner, and similar to brooding species over the first 9 months

after settlement (Szmant and Miller 2006). This pattern corresponds to the size of planulae; *A. palmata* eggs and larvae are much larger than those of *Montastraea* spp.

Development and growth

Most corals are colonial in that they are composed of individual units called polyps. Each polyp is an individual: it captures food, has independent digestive, nervous, respiration, and reproductive systems. A large coral colony has thousands of polyps working semi-independently to sustain the colony. Coral colonies grow via the addition (budding) of new polyps. By the same token, colonies can exhibit partial mortality whereby a subset of the polyps in a colony die, but the colony persists.

For most gorgonian genera, the major axial skeleton component is gorgonian, which is mainly composed of collagen fibers in a proteinaceous matrix (Leversee 1969). Gorgonin is deposited in concentric layers extracellularly around a central, hollow chambered canal, seldom exceeding a diameter of 100 µm. The axis functions as a mechanical support system facilitating the passive suspension feeding by octocorals (Lewis et al. 1992). The axis must be rigid enough to withstand the total water velocities for the particular habitat while supporting the polyps off the substratum (Muzik and Wainwright 1977). Lowenstam (1964) explains that the flexibility of the axial skeleton of gorgonians can apparently be modulated by sclerotization of the collagen within the axial skeleton. Gorgonian axes can be stiffened by the extracellular deposition of carbonates within the collagen interstitial spaces (Jeyasuria and Lewis 1987). Lewis et al. (1992) suggests that this process may be a mechanism for dealing with different hydrodynamic forces encountered at various depths.

Many gorgonian species can be characterized by a distinct colony form and a maximum colony size, indicating determinate growth, which suggests that growth is constrained in some way (Lasker et al. 2003). In two studies on *Pseudopterogorgia elisabethae*, the developmental cycle showed a rapid growth rate after settlement which then decreased dramatically with age, suggesting an age-dependent decrease in growth rate (Lasker et al. 2003, Goffredo and Lasker 2006). This size- or age-dependent decrease in growth rates may be due to interactions between the gorgonian colony and its environment (i.e., the balance between nutrient uptake and metabolic rates) instead of a genetically determined developmental plan (Lasker et al. 2003). A common method to determine growth rates of octocorals is by taking linear height measurements of a tagged colony over a period of time, the results usually varying between species. The most accurate method of estimating the age of a colony is counting growth rings seen within the axial skeleton rather than basing it on growth rates. However, counting growth rings usually requires the collection of the colony. Using both methods, height-age equations can be derived for a species (Grigg 1974).

Growth rates can vary dramatically within a species and between different species. Lasker et al. (2003) studied determinate growth in *Pseudopterogorgia elisabethae*. The resulting branch growth rates varied, ranging from negative values (branch loss) to 17.8 cm per year. A later study on this species performed by Goffredo and Lasker (2006) showed growth rates that decreased as a function of height. Colonies that were 0-10 cm in height had a growth rate of 3.5 cm per year; 20-30 cm colonies had a growth rate of 2.6cm per year; and 40-50

cm colonies had a growth rate of 0.5 cm per year. Yoshioka (1979) studied the ecology of *Pseudopterogorgia americana* and *Pseudopterogorgia acerosa*, calculating their linear growth rates to be about 5 cm per year for *P. americana* and 6 cm per year for *P. acerosa*.

Growth rates were higher for colonies exposed to higher light levels, showing that environmental factors affect the growth of a colony. Reproduction was delayed for 3–5 years until colonies were mature, ranging 15-30 cm respectively. Growth rates of *Pseudoplexaura porosa* branches can exceed 15cm per year (Lasker unpublished data). Due to these variations in growth rates, calculations determining the accurate age of a given colony should be based on growth rings and colony height (not solely on height).

Ecological Relationships

Octocorals derive energy from several sources including from sunlight through their photosynthetic, symbiotic zooxanthellae (algae living in the coral tissue), from consumption of zooplankton, from bacteria (which act as biochemical recycling agents), from consumption of detritus, and perhaps even directly from dissolved organics.

Corals are subject to the ecological pressures of predation (by fish and invertebrates), competition for space, and other interactions with associated organisms. In some instances, such as the symbiotic relationship of corals to zooxanthellae, the association is mutually beneficial. At the other end of the spectrum, however, are predatory pressures such as those applied by certain reef fishes and invertebrates that eat corals.

The importance of coral ecosystems and associated habitats has been well documented by numerous studies, reviews, and symposia (e.g., Jones and Endean 1973; Bright and Pequegnat 1974; Taylor 1977; Bright et al. 1981; Jaap 1984; Jaap and Hallock 1990; Chiappone 1996). Many of those documents emphasize the complex structure of coral ecosystems, the importance of coral for habitat, the sedentary lifestyle and its implications, the wide geographic and bathymetric distributions, and the many behavioral, physiological, ecological, and physical associations that combine to yield an exceedingly complex biological community. The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) recognizes these values and lists several corals as continental shelf fishery resources subject to exclusive U.S. use beyond the EEZ.

Ecosystems which include coral (hardbottoms, coral reefs, and coral communities) often represent unique arrays of plants and animals in an integrated ecosystem. The key to many of these systems, if there can be one most important link, is often coral itself, since the corals provide habitat and/or food for most of the other members of the ecosystem. Connell (1973) and Grassle (1973) have studied aspects of population ecology and diversity within coral reefs. Individual biotic components have also been studied -- among them, microbes (DiSalvo 1973), algae (Cribb 1973), holothurians (Bakus 1973), shrimps and prawns (Bruce 1976), echinoderms (Clark 1976), fishes (Goldman and Talbot 1976), and others. The resultant coral community is exceedingly complex and productive. Helfrich and Townsley (1965), Odum (1971), DiSalvo (1973), Sorokin (1973), and others have attempted to quantify

and qualify the productivity of corals and their associated biota (e.g., microorganisms) compared to other marine and terrestrial communities.

Because of their vast species diversity, trophic complexity, and productivity, mature coral communities possess numerous mechanisms that past researchers believed may enable them to resist normal disturbances, especially those biological in nature (Endean 1976). However, coral reefs have declined throughout the Caribbean including off the Florida coast over the past several decades. Numerous factors play major roles in coral health and may potentially threaten the continued viability of domestic corals. These factors include water quality, algal blooms, increased water temperatures, physical impacts from ship groundings and marine construction activities, sedimentation, pollution, nutrient enrichment, diver/snorkeler damage, disease, and over-fishing. Most of the coral reefs and coral communities in the management area may be degraded to such a degree that self-regulating mechanisms are no longer functional.

The special nature of corals as a fishery is further highlighted by their sedentary attached (not mobile) existence, which separates them from the subjects of many other fishery plans. Protection via escape or camouflage is limited by the design of coral skeletons and polyps. Although some protection is afforded by polyp withdrawal, strict energy budgets restrict the use of such behavior. Hence, in the midst of persistent adversity, (e.g., water pollution, extreme temperatures, sedimentation), corals appear precariously susceptible. The life history of the octocorallian and scleractinian corals is similar to the other invertebrate species. The fruits of coral sexual reproduction are planulae larvae; the larvae are free living (planktonic or benthic). The larvae select settlement sites through chemoreceptors, settle, and undergo metamorphosis to juvenile, sessile corals. Because of their vulnerability to environmental conditions, continued survival of corals will be dependent on management strategies that incorporate more of an ecosystem approach and tackle large scale issues such as water quality.

3.2.1.2 Snapper Grouper Complex

A detailed description of the 73 species included in the Snapper Grouper fishery management unit (FMU) is presented in Section 4.1.2 of the Fishery Ecosystem Plan (SAFMC 2009a). A description of the habitats occupied by snapper grouper species, their abundance and the current status of the stocks is also included in this section.

3.2.1.1 Coastal Migratory Pelagics

A detailed description of the coastal migratory pelagic species, their abundance and the current status of the stocks and the habitats they occupy is presented in Section 4.1.3 of the Fishery Ecosystem Plan (SAFMC 2009a).

3.2.1.2 Pelagic *Sargassum*

A detailed description of Pelagic *Sargassum* is presented in Section 4.1.7 of the Fishery Ecosystem Plan (SAFMC 2009a). A description of the oceanographic habitats occupied by pelagic *Sargassum* is presented in Section 3.1.2 of this Amendment.

3.2.2 Protected Species

There are 31 different species of marine mammals that may occur in the South Atlantic region. All marine mammal species are protected under the Marine Mammal Protection Act and six are also listed as endangered under the ESA (i.e., sperm, sei, fin, blue, humpback, and North Atlantic right whales). Other species listed under the ESA that occur in the South Atlantic include five species of sea turtle, a species of marine fish, and two coral species. Designated critical habitat for some of these species also occurs in the South Atlantic region. A discussion of these species and their critical habitat is below.

3.2.2.1 Endangered Species Act (ESA)-Listed Species

Species and Designated Critical Habitat in the Action Area Under NOAA Fisheries' Purview

Endangered

Blue whale	*Balaenoptera musculus*
Humpback whale	*Megaptera novaeangliae*
Fin whale	*Balaenoptera physalus*
North Atlantic right whale	*Eubalaena glacialis*
Sei whale	*Balaenoptera borealis*
Sperm whale	*Physeter macrocephalus*
Leatherback sea turtle	*Dermochelys coriacea*
Hawksbill sea turtle	*Eretmochelys imbricata*
Kemp's Ridley turtle	*Lepidochelys kempii*
Green turtle*	*Chelonia mydas*
Smalltooth sawfish**	*Pristis pectinata*

Threatened

Loggerhead turtle	*Caretta caretta*
Elkhorn coral	*Acropora palmata*
Staghorn coral	*A. cervicornis*

Proposed Species

Atlantic sturgeon***	*Acipenser oxyrinchus oxyrinchus*

*Green turtles in U.S. waters are listed as threatened except the Florida breeding population, which is listed as endangered.
**U.S. distinct population segment (DPS)
*** North Carolina and South Carolina DPS

Critical Habitat

North Atlantic right whale critical habitat has been designated in the U.S. Southeast Atlantic from the mouth of the Altamaha River, Georgia, to Jacksonville, Florida, out 27 kilometers (15 nautical miles) and from Jacksonville, Florida, to Sebastian Inlet, Florida, out 9 kilometers (5 nautical miles). A portion of this area lies within the South Atlantic EEZ.

The physical feature essential to the conservation of elkhorn and staghorn corals is: substrate of suitable quality and availability to support larval settlement and recruitment, and re-attachment and recruitment of asexual fragments. ‘‘Substrate of suitable quality and availability’’ is defined as natural consolidated hard substrate or dead coral skeleton that is free from fleshy or turf macroalgae cover and sediment cover.

Critical habitat includes one specific area of the Atlantic Ocean offshore of Palm Beach, Broward, Miami-Dade, and Monroe counties, Florida, and three specific areas of the Atlantic Ocean and Caribbean Sea offshore of the U.S. Territories of Puerto Rico and the U.S. Virgin Islands. The boundaries of specific critical habitat area within the South Atlantic EEZ are described below. Except as specified below, the seaward boundary is the 30-meter (98-foot) depth contour and the shoreward boundary is the line of mean low water (MLW; 33 CFR 2.20). Within these boundaries, discrete areas of water deeper than 30 meters (98 feet) are not included.

(1) Florida Area: The Florida area contains three sub-areas.

(i) The shoreward boundary for Florida sub-area A begins at the 1.8-meter (6-foot) contour at the south side of Boynton Inlet, Palm Beach County at 26° 32′ 42.5″ N; then runs due east to the point of intersection with the 30-meter (98-foot) contour; then follows the 30-meter (98-foot) contour to the point of intersection with latitude 25° 45′ 55″ N, Government Cut, Miami-Dade County; then runs due west to the point of intersection with the 6-foot (1.8-meter) contour, then follows the 1.8-meter (6-foot) contour to the beginning point.

(ii) The shoreward boundary of Florida sub-area B begins at the MLW line at 25° 45′ 55″ N, Government Cut, Miami-Dade County; then runs due east to the point of intersection with the 30-meter (98-foot) contour; then follows the 30-meter (98-foot) contour to the point of intersection with longitude 82° W; then runs due north to the point of intersection with the South Atlantic Fishery Management Council (South Atlantic Council) boundary at 24° 31′ 35.75″ N; then follows this boundary to a point of intersection with the MLW line at Key West, Monroe County; then follows the MLW line, the Council boundary (see 50 CFR 600.105(c)), and the COLREGS line (see 33 CFR 80.727. 730, 735, and 740) to the beginning point.

(iii) The seaward boundary of Florida sub-area C (the Dry Tortugas) begins at the northern intersection of the 30-meter (98-foot) contour and longitude 82° 45’ W; then follows the 30-meter (98-foot) contour west around the Dry Tortugas, to the southern point of intersection with longitude 82° 45’ W; then runs due north to the beginning point.

<u>Species under U.S. Fish and Wildlife Service (USFWS) Jurisdiction:</u>
<u>Endangered</u>

Bermuda Petrel	*Pterodrama cahow*
Roseate Tern****	*Sterna dougallii*

**** North American populations Federally listed under the ESA: endangered on Atlantic coast south to NC, threatened elsewhere.

3.2.2.1.1 ESA-Listed Sea Turtles

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

Green sea turtle hatchlings are thought to occupy pelagic areas of the open ocean and are often associated with *Sargassum* rafts (Carr 1987; Walker 1994). Pelagic stage green sea turtles are thought to be carnivorous. Stomach samples of these animals found ctenophores and pelagic snails (Frick 1976; Hughes 1974). At approximately 20 to 25 centimeters (8-10 inches) carapace length, juveniles migrate from pelagic habitats to benthic foraging areas (Bjorndal 1997). As juveniles move into benthic foraging areas a diet shift towards herbivory occurs. They consume primarily seagrasses and algae, but are also know to consume jellyfish, salps, and sponges (Bjorndal 1980, 1997; Paredes 1969; Mortimer 1981, 1982). The diving abilities of all sea turtles species vary by their life stages. The maximum diving range of green sea turtles is estimated at 110 meters (360 feet) (Frick 1976), but they are most frequently making dives of less than 20 meters (65 feet) (Walker 1994). The time of these dives also varies by life stage. The maximum dive length is estimated at 66 minutes with most dives lasting from 9 to 23 minutes (Walker 1994).

The **hawksbill's** pelagic stage lasts from the time they leave the nesting beach as hatchlings until they are approximately 22-25 centimeters (8-10 inches) in straight carapace length (Meylan 1988; Meylan and Donnelly 1999). The pelagic stage is followed by residency in developmental habitats (foraging areas where juveniles reside and grow) in coastal waters. Little is known about the diet of pelagic stage hawksbills. Adult foraging typically occurs over coral reefs, although other hard-bottom communities and mangrove-fringed areas are occupied occasionally. Hawksbills show fidelity to their foraging areas over several years (van Dam and Diéz 1998). The hawksbill's diet is highly specialized and consists primarily of sponges (Meylan 1988). Gravid females have been noted ingesting coralline substrate (Meylan 1984) and calcareous algae (Anderes Alvarez and Uchida 1994), which are believed to be possible sources of calcium to aid in eggshell production. The maximum diving depths of these animals are not known, but the maximum length of dives is estimated at 73.5 minutes. More routinely, dives last about 56 minutes (Hughes 1974).

Kemp's ridley hatchlings are also pelagic during the early stages of life and feed in surface waters (Carr 1987; Ogren 1989). Once the juveniles reach approximately 20 centimeters (8 inches) carapace length they move to relatively shallow (less than 50 meters; 164 feet.) benthic foraging habitat over unconsolidated substrates (Márquez-M. 1994). They have also been observed transiting long distances between foraging habitats (Ogren 1989). Kemp's ridleys feeding in these nearshore areas primarily prey on crabs, though they are also known to ingest mollusks, fish, marine vegetation, and shrimp (Shaver 1991). The fish and shrimp Kemp's ridleys ingest are not thought to be a primary prey item but instead may be scavenged opportunistically from bycatch discards or from discarded bait (Shaver 1991). Given their predilection for shallower water, Kemp's ridleys most routinely make dives of 50

m or less (Soma 1985; Byles 1988). Their maximum diving range is unknown. Depending on the life stage Kemp's ridleys may be able to stay submerged anywhere from 167 minutes to 300 minutes, though dives of 12.7 minutes to 16.7 minutes are much more common (Soma 1985; Mendonca and Pritchard 1986; Byles 1988). Kemp's ridleys may also spend as much as 96% of their time underwater (Soma 1985; Byles 1988).

Leatherbacks are the most pelagic of all ESA-listed sea turtles and spend most of their time in the open ocean although they will enter coastal waters and are seen over the continental shelf on a seasonal basis to feed in areas where jellyfish are concentrated. Leatherbacks feed primarily on cnidarians (medusae, siphonophores) and tunicates. Unlike other sea turtles, leatherbacks' diets do not shift during their life cycles. Because leatherbacks' ability to capture and eat jellyfish is not constrained by size or age, they continue to feed on these species regardless of life stage (Bjorndal 1997). Leatherbacks are the deepest diving of all sea turtles. It is estimated that these species can dive in excess of 1000 meters (Eckert et al. 1989) but more frequently dive to depths of 50 to 84 meters (Eckert et al. 1986). Dive times range from a maximum of 37 minutes to more routines dives of 4 to 14.5 minutes (Standora et al. 1984; Eckert et al. 1986; Eckert et al. 1989; Keinath and Musick 1993). Leatherbacks may spend 74% to 91% of their time submerged (Standora et al. 1984).

Loggerhead hatchlings forage in the open ocean and are often associated with *Sargassum* rafts (Hughes 1974; Carr 1987; Walker 1994; Bolten and Balazs 1995). The pelagic stage of these sea turtles are known to eat a wide range of things including salps, jellyfish, amphipods, crabs, syngnathid fish, squid, and pelagic snails (Brongersma 1972). Stranding records indicate that when pelagic immature loggerheads reach 40-60 centimeters (16-23 inches) straight-line carapace length they begin to live in coastal inshore and nearshore waters of the continental shelf throughout the U.S. Atlantic (Witzell 2002). Here they forage over hard- and soft-bottom habitats (Carr 1986). Benthic foraging loggerheads eat a variety of invertebrates with crabs and mollusks being an important prey source (Burke et al. 1993). Estimates of the maximum diving depths of loggerheads range from 211 to 233 meters (692-764 feet.) (Thayer et al. 1984; Limpus and Nichols 1988). The lengths of loggerhead dives are frequently between 17 and 30 minutes (Thayer et al. 1984; Limpus and Nichols 1988; Limpus and Nichols 1994; Lanyan et al. 1989) and they may spend anywhere from 80 to 94% of their time submerged (Limpus and Nichols 1994; Lanyon et al. 1989).

3.2.2.1.2 ESA-Listed Marine Fish

The historical range of the **smalltooth sawfish** in the U.S. ranged from New York to the Mexico border. Their current range is poorly understood but believed to have contracted from these historical areas. In the South Atlantic region, they are most commonly found in Florida, primarily off the Florida Keys (Simpfendorfer and Wiley 2004). Only two smalltooth sawfish have been recorded north of Florida since 1963 (the first was captured off North Carolina in 1999 (Schwartz 2003) and the other off Georgia 2002 [Burgess unpublished data]). Historical accounts and recent encounter data suggest that immature individuals are most common in shallow coastal waters less than 25 meters (Bigelow and Schroeder 1953; Adams and Wilson 1995), while mature animals occur in waters in excess of 100 meters (Simpfendorfer, pers. communication). Smalltooth sawfish feed primarily on

fish. Mullet, jacks, and ladyfish are believed to be their primary food resources (Simpfendorfer 2001). Smalltooth sawfish also prey on crustaceans (mostly shrimp and crabs) by disturbing bottom sediment with their saw (Norman and Fraser 1938; Bigelow and Schroeder 1953).

NMFS convened the Smalltooth Sawfish Recovery Team, comprising sawfish scientists, managers, and environmental managers, to develop a plan to recover the U.S. distinct population segment (DPS) of smalltooth sawfish. The plan recommends specific steps to recover the DPS, focusing on reducing fishing impacts, protecting important habitats, and educating the public. The draft recovery plan was made available for public comment in August 2006 and can be found at www.nmfs.noaa.gov. On May 1, 2009, the Southeast Regional Office, Sustainable Fisheries Division, requested re-initiation of the Endangered Species Act Section 7 consultation on the South Atlantic shrimp fishery and its effects on smalltooth sawfish because the amount of authorized incidental take for smalltooth sawfish had been exceeded. The most recent biological opinion on shrimp fishing under the Shrimp Fishery Management Plan for the South Atlantic, completed on February 25, 2005, concluded the continued authorization of the South Atlantic shrimp fishery is not likely to jeopardize the continued existence of smalltooth sawfish. An incidental take statement was issued authorizing the annual incidental lethal take of up to one smalltooth sawfish. A smalltooth sawfish take was observed in a shrimp trawl in the South Atlantic exclusive economic zone (EEZ) on July 26, 2008. It was in poor condition and believed not to have survived the interaction. Three additional smalltooth sawfish were observed taken in a shrimp trawls in the South Atlantic EEZ during a fishing trip from March 5-9, 2009. One of the smalltooth sawfish is thought to have died from the interaction; the other two were released alive and assumed to have survived.

Under the Endangered Species Act (ESA), it is illegal to catch or harm an endangered sawfish. However, some fishermen catch sawfish incidentally while fishing for other species. NMFS and the Smalltooth Sawfish Recovery Team have developed guidelines to fishermen telling them how to safely handle and release any sawfish they catch.

3.2.2.1.3 ESA-Listed Marine Invertebrates

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

Elkhorn and **staghorn** corals are two of the major reef-building corals in the wider Caribbean. In the South Atlantic region, they are found most commonly in the Florida Keys; staghorn coral occurs the furthest north with colonies documented off Palm Beach, Florida (26°3'N). The depth range for these species ranges from <1 meter (3 feet) to 60 meters (197 feet). The optimal depth range for elkhorn is considered to be 1 to 5 meters (3-16 feet) depth (Goreau and Wells 1967), while staghorn corals are found slightly deeper, 5 to 15 meters (16-49 feet) (Goreau and Goreau 1973).

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

Fertilization and development of elkhorn and staghorn corals is exclusively external. Embryonic development culminates with the development of planktonic larvae called planulae (Bak *et al.* 1977; Sammarco 1980; Rylaarsdam 1983). Unlike most other coral larvae, elkhorn and staghorn planulae appear to prefer to settle on upper, exposed surfaces, rather than in dark or cryptic ones (Szmant and Miller 2006), at least in a laboratory setting. Studies of elkhorn and staghorn corals indicated that larger colonies of both species[1] had higher fertility rates than smaller colonies (Soong and Lang 1992).

3.2.2.2 Species of Concern

NOAA Fisheries Service has created a list of Species of Concern (SOC) as a publicly available list identifying other species of concern. These are species about which NOAA Fisheries Service has some concerns regarding status and threats. NOAA Fisheries Service uses the list to draw proactive attention and conservation action to these species. No federal mandate protects species of concern under the ESA although voluntary protection of these species is urged. NOAA Fisheries Service recently received petitions to list five SOC species (denoted below). NOAA Fisheries Service is currently reviewing those petitions to determine if further investigation into whether these species should be listed under the ESA is warranted.

List of Marine Species of Concern in the Southeastern United States

Dusky shark	*Carcharhinus obscurus*	
Sand tiger shark	*Odontaspis taurus*	
Mangrove rivulus	*Rivulus mamoratus*	
Opossum pipefish	*Microphis barchyurus lineatus*	
Key silverside	*Menidia conchorum*	
Speckled hind	*Epinephelus drummondhayi*	(petition pending)
Warsaw grouper	*Epinephelus nigritus*	(petition pending)
Nassau grouper	*Epinephelus striatus*	(petition pending)
Ivory Tree Coral	*Oculina varicose*	
Saltmarsh Topminnow	*Fundulus jenkinsi*	(petition pending)
Striped Croaker	*Bairdiella sanctaeluciae*	
Alabama Shad	*Alosa alabamae*	(petition pending)

3.3 Essential Fish Habitat (EFH)

[1] As measured by surface area of the live colony

The Magnuson-Stevens Act defines EFH as "all waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity." The Magnuson-Stevens Act directs Regional Fishery Management Councils to describe and identify EFH for each federally managed species, to minimize the extent of adverse effects on habitat caused by fishing and non-fishing activities, and to identify actions to encourage conservation and enhancement of those habitats. It is required that EFH designations be based on the best available scientific information.

EFH designations may include habitat for an individual species or an assemblage of species, whichever is appropriate within a particular Fishery Management Plan. Under the definition of EFH:

- "Waters" includes aquatic areas and their associated physical, chemical, and biological properties that are utilized by fish. When appropriate this may include areas used historically.
- "Necessary" means the habitat required to support a sustainable fishery and a healthy ecosystem, while "spawning, breeding, feeding, or growth to maturity" covers the full life cycle of a species.
- "Substrate" includes sediment, hardbottom, structures underlying the waters, and associated biological communities.

Councils should obtain information to describe and identify EFH from the best available sources. Information should be analyzed and organized as follows, striving to describe habitat based on their highest level of detail:

- Level 1: species distribution data for all or part of its geographic range;
- Level 2: data on habitat-related densities or relative abundance of the species;
- Level 3: data on growth, reproduction, and survival rates within habitats; and
- Level 4: production rates by habitat

In addition to EFH, the Councils may identify EFH- HAPCs as a subset of EFH. In determining which areas should be designated as HAPCs, the area must meet one or more of the following criteria:

- Importance of the ecological function provided by the habitat;
- Extent to which the habitat is sensitive to human-induced environmental degradation;
- Whether, and to what extent, development activities are, or will be, stressing the habitat type; and
- Rarity of the habitat type

Council Habitat Responsibilities as Defined in the Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Act provides for authorities and responsibilities of the Secretary of Commerce and Fishery Management Council for the protection of EFH. Section 305 (b) Fish Habitat, requires the Secretary (through NOAA Fisheries Service) to assist the Councils in the description and identification of EFH in fishery management plans (including adverse impacts on such habitat) and in the consideration of actions to ensure the conservation and

enhancement of such habitat. In addition, the Secretary (through NOAA Fisheries Service) was required to: set forth a schedule for the amendment of fishery management plans to include the identification of EFH and for the review and updating of such identifications based on new scientific evidence or other relevant information; in consultation with participants in the fishery, provide each Council with recommendations and information regarding each fishery under that Council's authority to assist it in the identification of EFH, the adverse impacts on that habitat, and the actions that should be considered to ensure the conservation and enhancement of that habitat; review programs administered by the Department of Commerce and ensure that any relevant programs further the conservation and enhancement of EFH; and coordinate with and provide information to other federal agencies to further the conservation and enhancement of EFH.

The Magnuson-Stevens Act specifies that each federal agency shall consult with the Secretary with respect to any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any EFH identified under the Magnuson-Stevens Act. Additional provisions specify that each Council: may comment on and make recommendations to the Secretary and any federal or state agency concerning any activity authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by any federal or state agency that, in the view of the Council, may affect the habitat, including EFH, of a fishery resource under its authority; and shall comment on and make recommendations to the Secretary and any federal or state agency concerning any such activity that, in the view of the Council, is likely to substantially affect the habitat, including EFH, of an anadromous fishery resource under its authority. If the Secretary receives information from a Council or federal or state agency or determines from other sources that an action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by any state or federal agency would adversely affect any EFH identified under the Act, the Secretary shall recommend to such agency measures that can be taken to conserve such habitat. Within 30 days after receiving a recommendation, a federal agency shall provide a detailed response in writing to any Council commenting and the Secretary regarding the matter. The response shall include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on such habitat. In the case of a response that is inconsistent with the recommendations of the Secretary, the federal agency shall explain its reasons for not following the recommendations.

The South Atlantic Council's current process for reviewing and commenting on projects is described in Appendix A of the Habitat Plan (SAFMC 1998a).

On December 19, 1997, an interim final rule was published in the *Federal Register* to implement the EFH provisions of the Magnuson-Stevens Act. This rule established guidelines to assist the Councils and the Secretary of Commerce in the description and identification of EFH in fishery management plans, including identification of adverse impacts from both fishing and non-fishing activities on EFH, and identification of actions required to conserve and enhance EFH. The regulations also detailed procedures the Secretary (acting through NOAA Fisheries Service), other federal agencies, state agencies,

and the Councils can use to coordinate, consult, or provide recommendations on federal and State activities that may adversely affect EFH. The intended effect of the rule is to promote the protection, conservation, and enhancement of EFH. On January 17, 2002, the Final Rule for EFH was published with an effective date of February 19, 2002. This rule supersedes the interim final rule with the main changes being in the procedures for consultation, coordination, and recommendations on permit activities and guidelines for EFH information in fishery management plans. The final rule provides more clear guidelines for prioritizing and analyzing habitat effects for managed species. The final rule retains the four-level system for assessing the data applied in identifying EFH. The final rule provides more flexibility in designating EFH when information is limited and allows Councils to use available distribution information as well as presence/absence data. It also allows informed decision based on similar species and other life stages.

The Habitat Plan (SAFMC 1998a) was the initial synthesis of technical information for the EFH designated in the Comprehensive EFH Amendment to the Fishery Management Plans of the South Atlantic Region (SAFMC 1998b). The Fishery Ecosystem Plan (SAFMC 2009a) updates that technical information and presents refined information on habitat requirements (by life stage where information exists) for species managed by the South Atlantic Council, including information on environmental and habitat variables that control or limit distribution, abundance, reproduction, growth, survival, and productivity of the managed species.

The South Atlantic Council, in working with its Habitat and Environmental Protection and Coral Advisory Panels and through a series of workshops, reviewed the Fishery Ecosystem Plan (SAFMC 2009a) to identify available environmental and fisheries data useful in describing and identifying EFH. In addition to the members of these Advisory Panels, the workshops included relevant experts from state, federal, and regional levels.

The review continued the South Atlantic Council's ecosystem approach to designating EFH and is consistent with NOAA Fisheries Service guidelines and broader goals for ecosystem management. The South Atlantic Council further pursues this ecosystem approach via a set of formal, published habitat policies that are tailored to specific management issues.

Maps of EFH and EFH-HAPCs under the Final EFH Rule

The Final EFH Rule requires Fishery Management Plans to include maps that display, within the constraints of available information, the geographic locations of EFH or the geographic boundaries within which EFH for each species and life stage is found. To the extent practicable, maps should identify the different types of habitat designated as EFH, explicitly distinguish EFH from non-EFH areas, and be incorporated into a geographic information system (GIS) to facilitate analysis and presentation. While GIS, in combination with models that examine habitat requirements, can be used as a tool for designating EFH, current data availability do not support such use at this time for the South Atlantic at fine spatial scales. Instead, the best use of GIS within the South Atlantic is visualizing where EFH occurs at coarse spatial scales.

Mapping efforts require accuracy standards for location and thematic content as well as designation of minimum mapping units (i.e., the smallest area that the map will depict for a thematic category, such as seagrass). Mapping standards for EFH have not yet been set. While technological improvements within the surveying and remote sensing communities are rapidly increasing location and thematic accuracy, designation of minimum mapping units for EFH has not progressed similarly since enactment of the EFH Final Rule. Within the South Atlantic, especially for estuaries, the data available for mapping the locations of EFH are not at a geographic scale suitable for use in most EFH consultations. For example, data on the location of salt marshes that have a minimum mapping unit of one acre usually will not show fringe marshes, which are the subject of many EFH consultations. As additional information becomes available, it is advisable to develop minimum mapping units for the specific habitat types that are designated as EFH. These standards also might be tiered to account for geographic realm (e.g., riverine, estuarine, coastal, and offshore areas), life stages, data rich versus data poor species, and number of species within a fishery management plan (FMP).

While remaining mindful of the above caveats, the South Atlantic Council has developed an Internet Map Server (IMS), and an EFH Arc Service for displaying EFH and EFH-HAPCs within the constraints of available data and technology. The IMS and EFH Arc Service contain GIS layers showing the general distribution and geographic limits of EFH by life history stage (Figure 3-1). The IMS is largely based on information developed by the South Atlantic Council, Florida Fish & Wildlife Research Institute, NOAA Fisheries Service Southeast Fisheries Science Center, North Carolina Division of Marine Fisheries, and South Carolina Department of Natural Resources. The datasets provided vary in accuracy, scale, completeness, extent of coverage, and origin. Several data layers were derived from other sources and this processing can affect the fidelity of the underlying data. While the South Atlantic Council encourages use of these GIS data, users are urged to thoroughly review the metadata and original source documentation prior to interpreting the GIS data. It is the user's responsibility to ensure data are used in a manner consistent with stated limitations.

As new data become available, the South Atlantic Council will update the IMS and EFH Arc Service to ensure the public has the best available spatial depictions of EFH descriptions. While the South Atlantic Council believes spatial depictions of EFH and EFH-HAPCs are informative, textual descriptions within the Comprehensive EFH Amendment (SAFMC 1988b) are the ultimate source for determining the limits of EFH and EFH-HAPCs. The IMS can be found at: http://ocean.floridamarine.org/efh_coral/ims/viewer.htm. The EFH Arc Service can be found at: http://ocean.floridamarine.org/SAFMC_EFH/ .

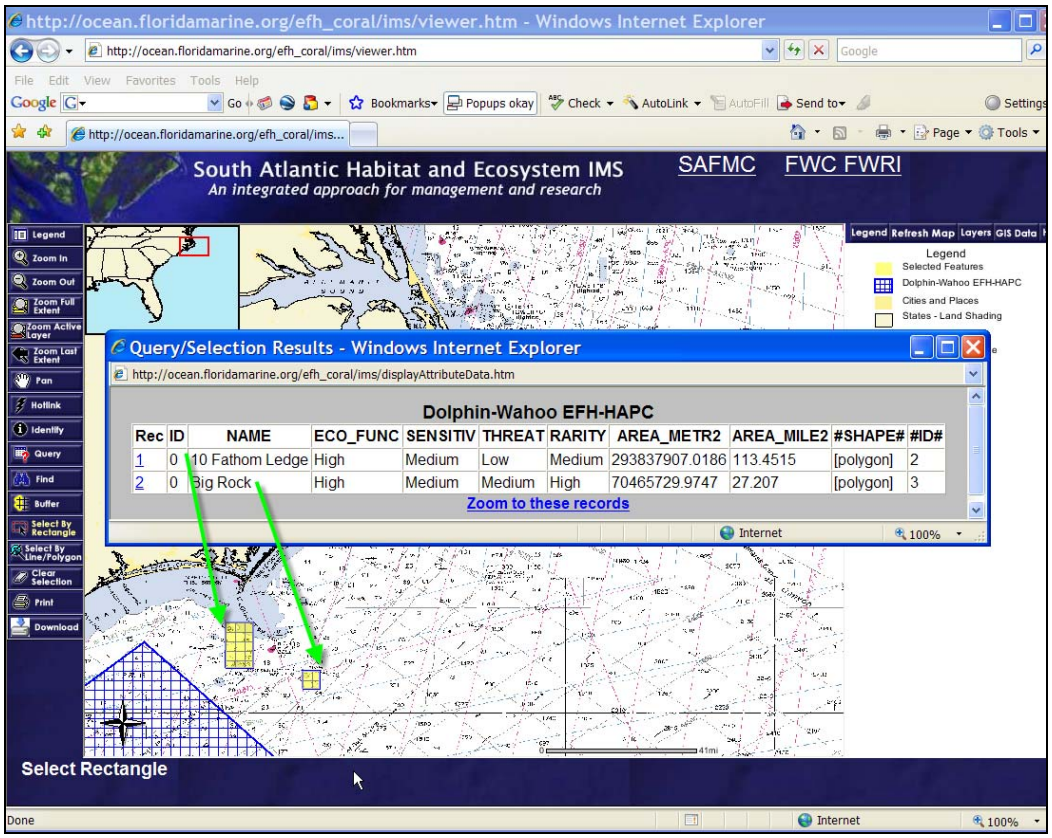


Figure 3-1. Sample screen shot of spatial presentation of EFH-HAPCs on South Atlantic Habitat and Ecosystem IMS.

EFH 5-Year Review

The Final EFH Rule requires EFH designations to be reviewed every 5 years. Activities associated with this first 5-year review included the South Atlantic Council updating and expanding the Habitat Plan (SAFMC 1998a) into the Fishery Ecosystem Plan (SAFMC 2009a). Actions recommended by the 5-year review for the South Atlantic Council to take include those described in CE-BA 1 (SAFMC 2009b) and CE-BA 2. NOAA Fisheries Service in March 2011, provided the South Atlantic Council with a summary report highlighting these activities as part of its requirement to document and approve the first 5-year EFH review. A few key elements of the South Atlantic Council's review are summarized below.

The Fishery Ecosystem Plan (SAFMC 2009a) presents information on adverse effects from fishing and describes management measures the South Atlantic Council has implemented to minimize adverse effects on EFH from fishing. The conservation and enhancement measures implemented by the South Atlantic Council to date may include ones that eliminate or minimize physical, chemical, or biological alterations of the substrate, and loss of, or injury to, benthic organisms, prey species and their habitat, and other components of the ecosystem. The South Atlantic Council has implemented restrictions on fisheries to the extent that no significant activities were identified in the review of gear impact conducted for the NOAA Fisheries Service by Auster and Langton (1998) that presented available information on

adverse effects of all fishing equipment types used in waters described as EFH. The South Atlantic Council has already prevented, mitigated, or minimized most adverse effects from most fisheries prosecuted in the South Atlantic EEZ.

The South Atlantic Council considered evidence that some fishing practices may have an identifiable adverse effect on habitat and addressed those pertaining to deepwater coral ecosystems in CE-BA 1 (SAFMC 2009b). The South Atlantic Council has already used many of the options recommended in the guidelines for managing adverse effects from fishing including: fishing equipment restrictions; seasonal and areal restrictions on the use of specified gear; equipment modifications to allow the escape of particular species or particular life stages (e.g., juveniles); prohibitions on the use of explosives and chemicals; prohibitions on anchoring or setting equipment in sensitive areas; prohibitions on fishing activities that cause significant physical damage in EFH; time/area closures including closing areas to all fishing or specific equipment types during spawning, migration, foraging, and nursery activities; designating zones as Marine Protected Areas to limit adverse effects of fishing practices on certain vulnerable or rare areas/species/life history stages, such as those areas designated as EFH-HAPCs; and harvest limits.

The Fishery Ecosystem Plan (SAFMC 2009a) identifies non-fishing related activities that have the potential to adversely affect EFH quantity or quality. Examples of these activities are dredging, filling, mining, impounding or diverting waters altering thermal regimes, actions that contribute to non-point source pollution and sedimentation, introduction of potentially hazardous materials, introduction of exotic species, and the conversion of aquatic habitat that may eliminate, diminish, or disrupt the functions of EFH. Included in the Fishery Ecosystem Plan is an analysis of how fishing and non-fishing activities influence habitat function. This information presents available information describing the ecosystem or watershed and the dependence of managed species on the ecosystem or watershed. An assessment of the cumulative and synergistic effects of multiple threats, including the effects of natural stresses (such as storm damage or climate-based environmental shifts), and an assessment of the ecological risks resulting from the impact of those threats on the managed species' habitat is included.

General conservation and enhancement recommendations are included in Volume IV of the Fishery Ecosystem Plan (SAFMC 2009a). These include recommending the enhancement of rivers, streams, and coastal areas; protection of water quality and quantity; and recommendations to local and State organizations to minimize destruction/degradation of wetlands, restore and maintain the ecological health of watersheds, and replace lost or degraded EFH.

The South Atlantic Council will periodically review and update EFH information and revise the Fishery Ecosystem Plan (SAFMC 2009a) as new information becomes available. NOAA Fisheries Service will provide some of this information to the South Atlantic Council as part of the annual Stock Assessment and Fishery Evaluation report. A complete update of and assessment of EFH information will also be conducted at least every 5 years. Amendments to EFH or EFH-HAPCs will occur, when appropriate via the South Atlantic Council

established framework described in Section 4.2.8 of the Comprehensive EFH Amendment (SAFMC 1998b) or by future Comprehensive Ecosystem-Based Amendments.

Proposed List of New EFH and EFH-HAPC:
The South Atlantic Council designated EFH-HAPCs to emphasize subsets of EFH that warrant special protection. EFH-HAPCs on their own do not carry regulatory authority; however, the FMPs under which they were designated may include regulations that protect habitat from fishing impacts. EFH-HAPCs include general habitat types (e.g., submerged aquatic vegetation) and geographic locations (e.g., Charleston Bump).

The EFH Final Rule identifies four criteria to be used to select candidate habitats or locations for EFH-HAPC designation:

1. Importance of the ecological function provided by the habitat (E)
2. Extent to which the habitat is sensitive to human-induced environmental degradation (S)
3. Whether, and to what extent, development activities are, or will be, stressing the habitat type (ES); and
4. Rarity of the habitat type (R).

After careful consideration of the Fishery Ecosystem Plan (SAFMC 2009a) and input from the South Atlantic Council Advisory Panels and other experts, the following new EFH-HAPCs are proposed along with their respective FMP(s) and EFH-HAPC criteria:

- Golden tilefish habitat and blueline tilefish habitat (Snapper Grouper) R, S, E
- Deepwater MPAs (Snapper Grouper – deepwater species/snowy grouper, golden tilefish) R, E
- The Gulfstream, Charleston Bump and the Point (*Sargassum*) R, E
- Deepwater Coral HAPCs (Coral) R, E

After similar consideration, the top 10 meters of the water column in the South Atlantic EEZ are proposed as EFH under the *Sargassum* FMP; as noted below, the FMP for *Sargassum* currently does not include an EFH designation.

3.4 Current EFH Designations

The Comprehensive EFH Amendment (SAFMC 1998b) and the FMP for the Dolphin Wahoo Fishery of the Atlantic provide the South Atlantic Council's current EFH and EFH-HAPC designations. Since CE-BA 2 only proposes amending designations made under the FMP for the Snapper Grouper Fishery of the South Atlantic (Snapper Grouper FMP) and the FMP for the Coral, Coral Reefs, and Live/Hardbottom Habitats of the South Atlantic Region (Coral FMP), only those EFH and EFH-HAPC designations are listed below.

3.4.1 Coral and Coral Reef FMP

Coral and Coral Reef EFH

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

A. EFH for hermatypic stony corals includes rough, hard, exposed, stable substrate from Palm Beach County south through the Florida reef tract in subtidal to 30 meters (98 feet) depth, subtropical (15-35°C; 59-95°F), oligotrophic waters with high (30-35 ppt) 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 EFH includes defined hard substrate in subtidal to outer shelf depths throughout the management area.

B. EFH for Antipatharia (black corals) includes rough, hard, exposed, stable substrate, offshore in high (30-35 ppt) salinity waters in depths exceeding 18 meters (54 feet), not restricted by light penetration on the outer shelf throughout the management area.

C. EFH 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. EFH 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.

Refer to Volume II of the FEP: Habitat and Species (SAFMC in prep.) for a more detailed description of habitat utilized by the managed species.

Coral and Coral Reef EFH-HAPCs

Existing EFH-HAPCs for coral, coral reefs, and live/hardbottom 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) hardbottom off the east coast of Florida from Cape Canaveral to Broward County; offshore (5-30 meters; 15-90 feet) hardbottom 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.

3.4.2 Snapper Grouper EFH and EFH-HAPCs

Snapper Grouper EFH

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

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

For specific life stages of estuarine dependent and near shore snapper grouper species, EFH includes areas inshore of the 30-meter (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/hardbottom habitats.

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

3.4.3 International Consideration of EFH

A resolution to protect pelagic *Sargassum* as essential fish habitat for highly migratory species, drafted by the National Coalition for Marine Conservation, was submitted by the US delegation at ICCAT's 2005 meeting in Seville, Spain. This represents a first action by ICCAT to address habitat and ecosystem concerns.

3.5 Administrative Environment

3.5.1 The Fishery Management Process and Applicable Laws

3.5.1.1 Federal Fishery Management

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

Responsibility for federal fishery management decision-making is divided between the U.S. Secretary of Commerce (Secretary) and eight regional fishery management councils that

represent the expertise and interests of constituent states. Regional councils are responsible for preparing, monitoring, and revising management plans for fisheries needing management within their jurisdiction. The Secretary is responsible for collecting and providing the data necessary for the councils to prepare fishery management plans and for promulgating regulations to implement proposed plans and amendments after ensuring that management measures are consistent with the Magnuson-Stevens Act and with other applicable laws summarized in **Appendix E**. In most cases, the Secretary has delegated this authority to NOAA Fisheries Service.

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

Public interests also are involved in the fishery management process through participation on Advisory Panels and through Council meetings, which, with few exceptions for discussing personnel matters, are open to the public. The South Atlantic Council uses a Scientific and Statistical Committee (SSC) to review the data and science being used in assessments and fishery management plans/amendments. In addition, the regulatory process is in accordance with the Administrative Procedures Act, in the form of "notice and comment" rulemaking.

3.5.1.2 State Fishery Management

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

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

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

3.5.2 Enforcement

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

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

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

3.6 Human Environment

3.6.1 Description of the Fisheries

3.6.1.1 Octocoral Fishery Description

3.6.1.1.1 History of the Commercial Fishery

The commercial live octocoral fishery probably dates back to the late 1950s or early 1960s when salt water aquariums first started to become popular and the supply of marine specimens began to appear in major cities in the United States. In the early days, filtration systems tended to be crude and the average marine aquarist stocked his aquarium with fish and a few common invertebrates such as crabs, shrimp, and starfish. As the hobby grew and filtration systems improved, more and more aquarists began to stock their aquariums with difficult-to-keep invertebrates such as clams, snails, stony corals, and octocorals. By 1980, the octocoral fishery was becoming well established, and a handful of the hardier octocoral species collected off the Florida coasts could be found in most large marine aquarium stores throughout the U.S. The demand for Florida octocorals has continued to grow, as has the list of species harvested and successfully kept in the average marine aquarium. Florida-collected octocorals dominate the U.S. market as well as some of the European and Asian markets.

The South Atlantic Council, together with the Gulf of Mexico Fishery Management Council, became the first fishery management councils to describe the octocoral fishery in 1982 in the original Coral FMP (SAFMC 1982). Amendment 1 to the Coral FMP, developed in 1990 set an annual harvest limit of 50,000 octocoral colonies from federal waters, allowed for a minimal bycatch of substrate around the holdfast, set allowable gear types, and defined the area where harvest was permitted. The FWC then ruled that octocoral harvest in Florida waters would be unlimited. If the EEZ yearly quota was reached before September 30, then harvest would be closed in state waters until the following October.

Over the years, there has been occasional interest in collecting octocorals for use in biomedical research. Past work has mostly focused on sampling a wide variety of species and searching for chemical compounds that might be of interest to this type of research. Compounds of interest were eventually synthesized in the lab, eliminating the need to continue harvesting specific octocoral species for their extraction (Ken Nedimeyer, pers. communication). No large-scale harvest of octocorals for biomedical purposes is presently taking place in the South Atlantic EEZ (Ken Nedimeyer, pers. communication).

Although octocoral harvest in the South Atlantic EEZ is legal in almost all areas from south of Cape Canaveral, the overwhelming bulk of the commercial octocoral harvest is located primarily in the Florida Keys. Harvest of octocorals from state waters occurs as far north as Jupiter Inlet, but it is also mostly a Florida Keys based fishery. Octocoral landings since 1991 indicate that the majority of the harvest has occurred on the east coast of Florida **(Figures 3-2 & 3-3)** and almost exclusively in the Florida Keys (Ken Nedimeyer, pers. communication). In this area, the shelf is narrower and water clarity is greater than off the west coast of Florida. Consequently, a greater variety of octocoral species is found in the

waters off the Florida Keys. In addition, conditions in the field are favorable to harvesting octocorals. Harvest data from 2000-2009 show that 84% of annual landings originate in state waters (**Table 3-2**). This trend has been anecdotally corroborated by the SAFMC Coral Advisory Panel.

3.6.1.1.2 Licenses and Permits

Commercial harvest of octocorals in federal waters is restricted to individuals or corporations holding a federal octocoral permit or a valid Florida Saltwater Products License (SPL) with a marine life (ML) endorsement issued by NOAA Fisheries Service. Saltwater products licenses from FWC are unrestricted, but the ML endorsement necessary to land commercial quantities of any organism designated as a "marine life" species, which includes all octocorals, is restricted. The commercial marine life fishery in Florida waters and the adjacent federal waters is managed by a limited entry program administered by the FWC, and only a limited number of the licenses currently issued are transferable and valid for harvesting octocorals. NOAA Fisheries Service has no record of issuance of a federal octocoral permit since 2004. FWC data from 2010 indicates there are 161 active ML endorsement licenses, including 108 ML transferable dive endorsements (MLD), 38 ML endorsements (MLB), and 22 ML non-transferable dive endorsements (MLN). Commercial harvesters must have an SPL, an MLD or an MLN, and a restricted species endorsement to collect. Since only MLD and MLN endorsements can be used to dive to collect octocorals, then only 130 possible harvesters could be collecting based on 2010 data.

In 2005, a three-tiered limited entry system was implemented by FWC with the industry recommendation, under which issuance of one of the types of endorsements was based how much income from ML sales that the applicant reported during at least one of the four qualifying harvest seasons (1999-2000, 2000-01, 2001-02, 2002-03). Issuance of a MLB or MLD endorsement required income reports of $1-$4,999 during at least one of the qualifying periods; a transferable MLD endorsement was issued to applicants with more than $5,000 from ML landings during on the years. Holders of transferable MLD endorsements are also allowed to hold multiple endorsements if they reported more than $10,000 in income during the qualifying periods.

No additional endorsements will be issued for the ML fishery, and as of 2010, only 4 MLNs have been forfeited to the State. Some endorsements are no activated each year, but a new rule starting 2011 requires annual 'requalification' for endorsement holders under the age of 62.

The FWC also has a Special Activities License (SAL) that can be issued to researchers, public aquariums, and educational institutions, which allows the harvest of octocorals in state and federal waters. The permit holder must state in the application the number and species of octocorals they wish to harvest, and the request is reviewed by FWC staff before being issued. Requests for any substantial amounts of octocoral harvest in federal waters are referred to NOAA Fisheries for review and approval. The SAL permit may have additional requirements or exemptions that are issued by the FWC on a case-by-case basis.

Recreational harvest of octocorals is permitted with a Florida Saltwater Fishing License (SFL) and is restricted to six specimens per day, and the harvest is considered part of the aggregate recreational bag limit of marine life, which is no more than a total of 20 marine specimens per license-holder per day. This permit must adhere to the most stringent of federal or state criteria.

3.6.1.1.3 Reporting requirements

All octocorals harvested commercially by ML fishermen must be reported monthly to the Florida Fish and Wildlife Research Institute (FWRI). Landings are reported on trip tickets that were originally designed to report landings of lobster and other marine resources. Landings must be identified as coming from specific zones along the coast, and within each zone it must be specified as coming from state or federal waters. On the trip ticket, however, an octocoral harvester cannot specifically report landings originating in different areas. Due to demand from the aquarium trade, harvesters often seek particular species in a certain size range; therefore, several areas may be harvested in one trip. This may have resulted in inadequate reporting of octocoral landings over the years.

3.6.1.1.4 Harvest Methods

Almost all commercial harvest of octocorals is done by marine life fishermen for the live aquarium trade; therefore, harvest is by hand and is done in small numbers on any given day. Because octocorals are listed as a marine life species by the FWC, fishermen harvesting them using a Florida SPL with ML endorsement must transport and land them in a live and healthy condition.

As many as 50 different species of octocorals are harvested off the east and west coasts of Florida, but only about a dozen species make up the majority of the harvest. In a typical day, a harvester may visit from six to eight sites to collect specimens; between 50 and 200 colonies are thus collected once every two or three weeks. Water depth ranges from 5 to 150 feet, but most specimens from federal waters are photosynthetic specimens from shallow waters (less than 80 feet). Sea fans, *Gorgonia ventalina*, and *G. flabellum* as well as all black corals of the genus *Antipathes* are protected in state and federal waters and there is no allowable harvest.

The aquarium trade has specific size and shape requirements, which force marine life fishermen to be very selective in their harvest. For the most part, small specimens are not selected by harvesters, and few specimens larger than about 20 inches are collected because they are too big for most aquariums and are difficult to ship. The standard shipping box has an inside dimension of 15 x 15 inches, so although a 20-inch specimen could fit diagonally in a standard box or could be bent, most wholesale shippers and purchasers prefer specimens less than 15 inches long. Shape and quality are other factors that fishermen must consider when selecting specimens. The ideal specimen is one that has several lateral branches and no dead spots or odd growths.

The Coral FMP states that harvest by non-powered hand tools is permitted. Most corals are harvested with a dive knife, a mason's hammer, or a hammer and wood chisel. The Coral

FMP allows for the harvest of a minimal amount of substrate (1 inch around the base of the octocoral), and most harvesters harvest much less than this amount. Allowing the substrate around the holdfast to be harvested reduces the chance of injuring the specimen and also makes it easier for the final consumer, the aquarist, to attach it to a rock in their aquarium or place it upright in the sand.

Most marine life fishing vessels are open, equipped with outboard motors, and less than 25 feet long. Fishermen either work alone or with one other person on the boat. Most divers use SCUBA gear, but a few use boat-mounted surface supplied air systems. Marine life vessels must have a continuously circulating live well or aeration or oxygenation system aboard the vessel of adequate size and capacity to maintain harvested organisms in a healthy condition (68B-42 of the Florida Administrative Code).

Recreational harvest is carried out similarly to the commercial harvest and uses the same types of vessels and gear. Recreational harvesters are not required to aerate their catch, but the catch must be landed live.

Allowable gear

Hand harvest is the only allowable method. A toxic chemical may not be used or possessed in a coral area in the EEZ. A power-assisted tool may not be used to take prohibited coral, allowable octocoral or live rock. Possession in the EEZ of coral resources harvested with a power-assisted tool is prohibited.

3.6.1.1.5 Economic description

The FWRI collects and maintains fishery harvest data for this fishery. However, the total economic value of the catch increases as the product moves from the harvester to the final consumer. The traditional chain of possession of the product is harvester to wholesaler to pet shop to aquarist, and traditionally the price is at least doubled at each step of the process. Therefore, a $4 octocoral reported to the FWRI will sell for at least $16 to the final aquarist, and could be much more than that. Most of this income comes into Florida from the rest of the United States and from other parts of the world (primarily Europe).

Octocoral harvest differs markedly between the South Atlantic and Gulf federal waters, with total harvest for 2000 through 2009 reported at 54,232 and 38,682 colonies, respectively (**Tables 3-2 & 3-3**). Similarly, harvest in South Atlantic federal waters versus state waters varies widely with a substantial majority of the landings in east Florida occurring in state waters (**Figure 3-2**). For the period 2000 through 2009, total harvest for South Atlantic federal and state waters was 54,232 and 275,882 colonies, respectively. Mean landings for the same time period were 5,423 and 27,588 colonies for federal and state waters, respectively. Total 2009 ex-vessel values for the same time period were $142,790 and $799,383 for South Atlantic federal and state waters, respectively (**Table 3-2**). Harvest levels have fluctuated over the last several years, with 2006 showing the highest landings (**Figure 3-2**). Total harvest levels in 2004 and 2005 were lower than those for 2003, most likely reflecting the disruptive impacts of hurricanes on the ability of the fishermen to harvest (**Table 3-2**). Re-growth of corals in an area scoured by hurricanes to a level that will sustain

a harvest varies from two to four years, depending on the habitat type and the targeted species. FWRI data indicate there were 26 fishermen reporting harvest from the South Atlantic EEZ from 2002 to 2006, and 103 fishermen reporting state harvest during that same time period (Ken Nedimeyer, pers. communication).

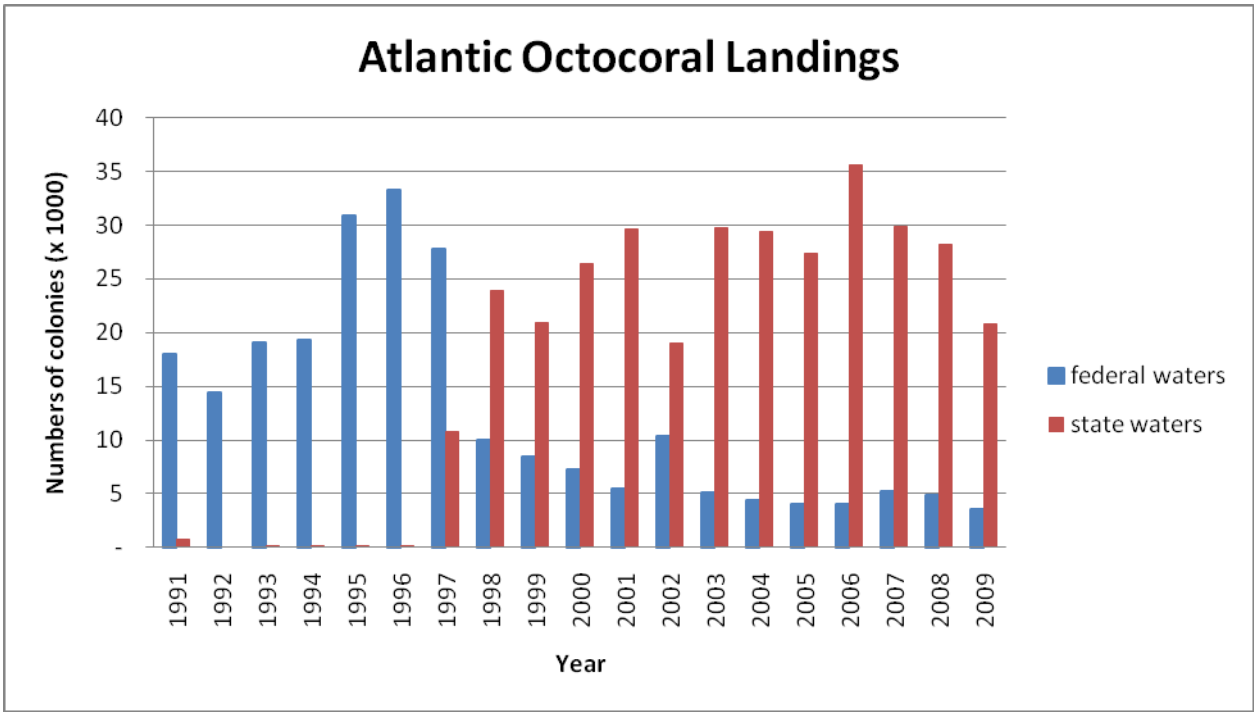


Figure 3-2. Octocoral harvest in South Atlantic Federal and State waters for the period 1991-2009 (Source: Florida Fish and Wildlife Research Institute).

Table 3-2. Octocoral harvest (in numbers of colonies) and 2009 ex-vessel value for South Atlantic Federal and State waters for the period 2000-2009.

Year	State/Fed Waters	Numbers of colonies	Ex-vessel Value 2009 ($)
2000	Federal	7,278	18,858
2001	Federal	5,432	12,998
2002	Federal	10,407	32,007
2003	Federal	5,049	15,275
2004	Federal	4,386	13,520
2005	Federal	4,007	12,928
2006	Federal	4,024	12,138
2007	Federal	5,250	16,332
2008	Federal	4,890	15,671
2009	Federal	3,509	10,396
TOTAL		**54,232**	**160,122**

2000	State	26,355	87,397
2001	State	29,624	95,429
2002	State	18,968	52,065
2003	State	29,768	88,201
2004	State	29,339	88,968
2005	State	27,401	86,739
2006	State	35,589	114,620
2007	State	29,824	99,956
2008	State	28,230	98,859
2009	State	20,784	70,281
TOTAL		**275,882**	**882,515**

(Source: Landings data provided by Florida Fish and Wildlife Research Institute).

In the Gulf of Mexico, total octocoral harvest in 2000-2009 was 38,682 and 54,620 colonies in federal and state waters, respectively (**Table 3-3**; **Figure 3-3**). As in the South Atlantic, harvest of octocorals in the Gulf of Mexico occurs mainly in state waters but mean landings over the period 2000-2009 were more similar than in South Atlantic waters at 3,868.20 and 5,462 colonies in federal and state waters, respectively.

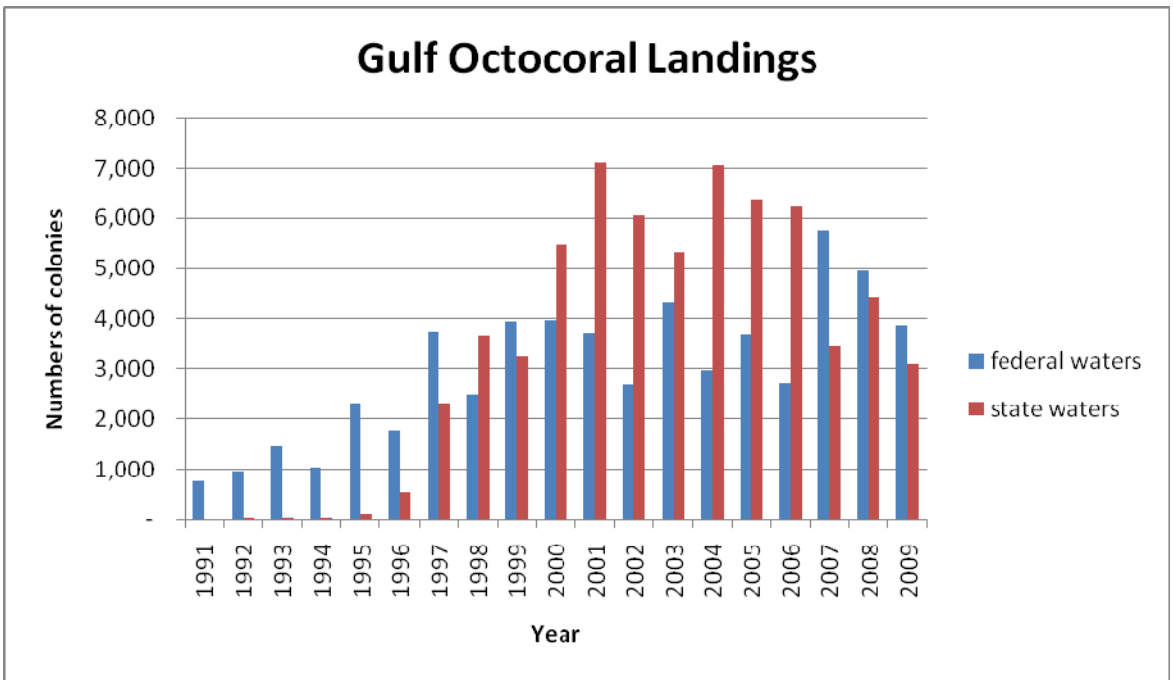


Figure 3-3. Octocoral harvest in Gulf of Mexico federal and state waters for the period 1991-2009 (Source: Florida Fish and Wildlife Research Institute).

Table 3-3. Octocoral harvest (in numbers of colonies) and 2009 ex-vessel value for Gulf of Mexico federal and state waters for the period 2000-2009.

Year	State/Fed	Numbers of colonies	Ex-vessel value 2009 ($)
2000	Federal	3,975	12,926
2001	Federal	3,728	9,085
2002	Federal	2,707	7,500
2003	Federal	4,331	14,936
2004	Federal	2,966	10,757
2005	Federal	3,693	15,509
2006	Federal	2,721	9,934
2007	Federal	5,747	22,301
2008	Federal	4,951	10,061
2009	Federal	3,863	15,504
TOTAL		**38,682**	**128,513**
2000	State	5,492	15,278
2001	State	7,110	26,965
2002	State	6,056	22,635
2003	State	5,336	18,148
2004	State	7,067	23,051
2005	State	6,351	16,053
2006	State	6,233	16,033
2007	State	3,451	12,269
2008	State	4,421	17,544
2009	State	3,103	13,235
TOTAL		**54,620**	**181,210**

(Source: Florida Fish and Wildlife Research Institute).

3.6.1.1.6 Social and cultural environment

In the 2010-11 harvest season there are 170 individuals or entities that hold the Florida Marine Life endorsement (108 MLD; 22 MLN; 40 MLB). Although the area where octocoral harvest is permitted extends from the Florida Keys to Cape Canaveral, the entire harvest from the South Atlantic EEZ is from the Florida Keys with most of the harvesters either living in the Florida Keys or in Southeast Florida. Based on addresses associated with ML endorsements, the majority of the ML endorsement holders live in the Florida Keys, mostly in the Lower Keys (**Figure 3-4**). There are five MLDs listed as aquarium shops, and one as a bait and tackle shop. Two of the MLB endorsement holders are fish houses on the West Coast, and one MLN endorsement is an aquarium shop. Within the Florida Keys, there is no harvest in Key Largo National Marine Sanctuary or in Biscayne National Park, and within the Florida Keys National Marine Sanctuary there are several closed areas where all consumptive harvest is prohibited.

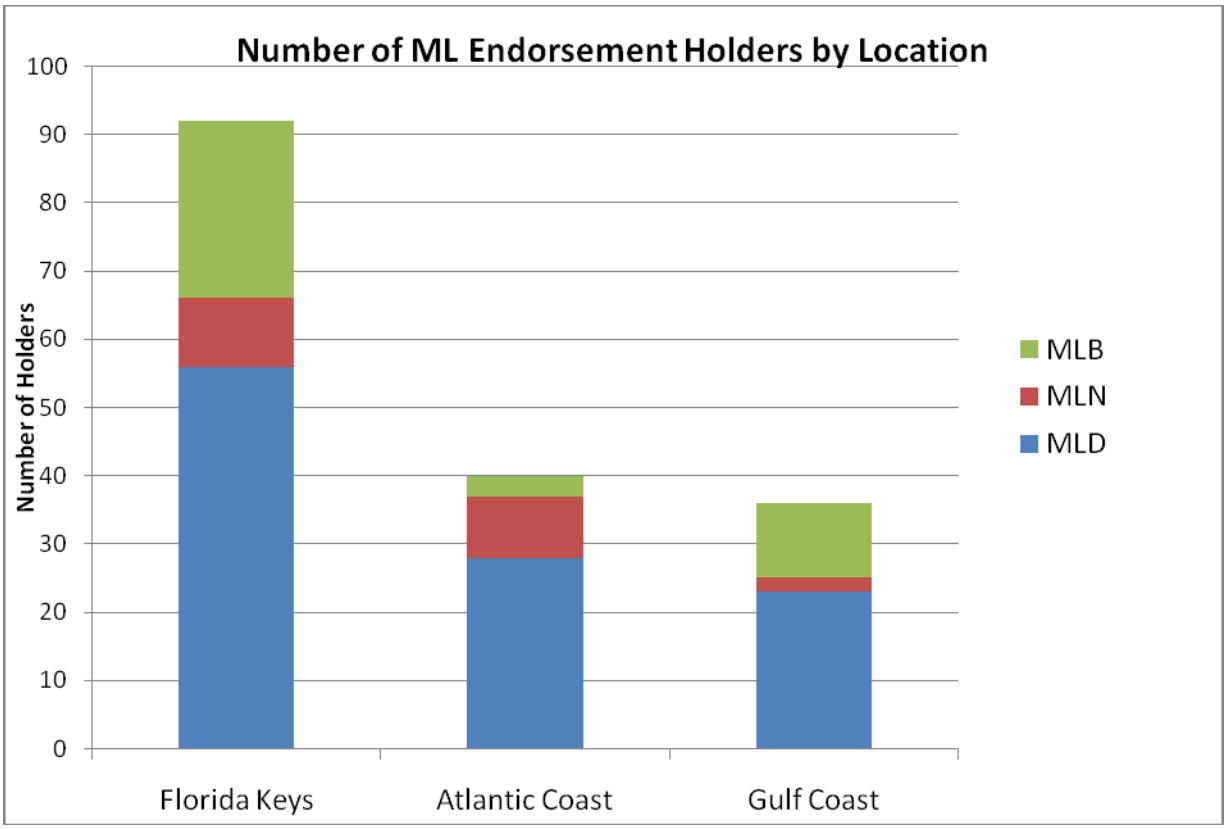


Figure 3-4. Geographic distribution of ML endorsement holders (source: FWC).

Octocorals are just one type of specimen that commercial ML harvesters target, and do not make up a significant portion of all ML landings. Additionally, there are daily harvest limits per endorsement on several ML finfish, invertebrates, and coral specimens. Because trips include collection of multiple species, of which some have daily limit, holders of MLD endorsements are permitted to 'stack' multiple endorsements on a SPL if they meet income requirements specified in the rule (>$10,000 of income from ML landings). It is common for a ML endorsement holder to have multiple SPLs and/or multiple vessels.

Of the 108 individuals or entities that hold MLD endorsements, 43 have single endorsements; 59 have two endorsements; 5 hold three; and one individual holds 4 MLD endorsements (**Figure 3-5**). The purpose of holding multiple endorsements is to increase the harvest limit, or to use MLD endorsements on multiple vessels at the same time. In general, MLD endorsement holders have participated in the ML fishery for ten or more years. Over half (56 holders) live in the Florida Keys and the rest are nearly evenly split on the southeast and west coasts of Florida.

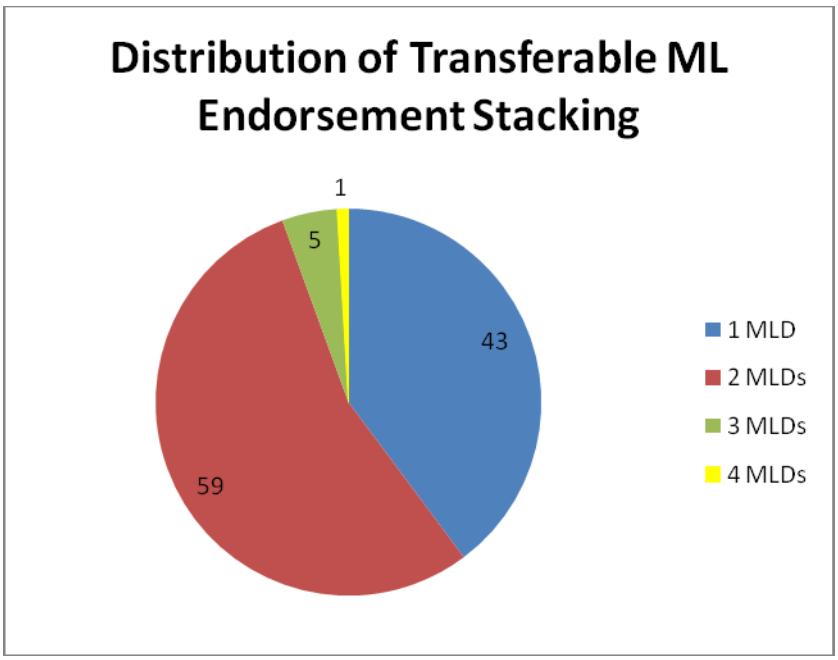


Figure 3-5. Number of MLD endorsement holders with multiple MLDs.

Of the 22 MLN endorsement holders, only ten are listed with addresses in the Florida Keys. The 43 MLB endorsement holders are primarily bait shrimpers and lobster/crab trap fishermen; most are listed with Florida Keys addresses, but 11 are on the west coast of Florida.

Marine Life endorsement holders can sell to local wholesalers, stores throughout the U.S. and Europe, or to another ML collector who also holds a wholesaler license. Most stores are outside of Florida, although some local aquarium shops hold their own MLD or MLN endorsements. Over the last few decades, demand has been fairly stable throughout the year and the fishery generally does not experience seasonal fluctuations. It is common for a ML collector to maintain established relationships with some buyers.

Monroe County

Monroe County had a total population of 79,589 in 2000, but this dropped slightly to an estimated 73,165 by 2009. The majority of residents identified themselves as White (92.0%) in 2000, and Hispanics made up 16% of the Keys population. In 2009, estimates suggest that the proportion of white residents is 91.1% while the Hispanic population increased to 19.6% of the population, a slight variation from statewide estimates of 21.5% (Hispanic) and 79.4% (White).

In general, residents of Monroe County are a little older (median age in 2009 = 45.4 years) than the statewide median age of 39.7 years. The percentage of persons below the poverty level is estimated at 10.4%, which was below the 13.3% for Florida overall during 2009. In the past few years, the owner-occupied housing rate for Monroe County dropped from 71.2% (2007) to 66.6% (2009); the statewide owner-occupied housing rate is estimated at 69.7% for

2009, a slight drop from the 2007 estimate of 70.3 percent. Cost of living in Monroe County has increased drastically over the past few decades and specifically, housing prices doubled from 2000 to 2007 (Shivlani 2009). An estimated 2.7% of the population in Monroe County are unemployed, about half that of the statewide unemployment estimate of 4.6 percent. Tourism is the most economically important industry in the Florida Keys and directly employs at least 19% of civilian workers (reported in 2009 Census estimate under "Arts, Entertainment and Recreation, and Accommodation Food Services").

The current fishery management unit extends through the EEZ of all South Atlantic states. However, the proposed actions in this amendment that pertain to octocorals primarily apply to the Florida Keys, where almost all harvest of octocorals occur. Information about communities in the rest of the South Atlantic can be found in (Jepson et al. 2005).

3.6.1.1.7 Bycatch

Because the octocorals are almost exclusively harvested one at a time by divers, there is very little bycatch. However, all octocorals most likely have communities of invertebrates living on them that may be specially adapted to each of the different species of octocorals. These invertebrates may include different types of shrimp, amphipods, nudibranchs, and starfish. Some of these organisms are occasionally seen on the specimens (in the field) or at the bottom of containers used to transport freshly harvested specimens, but the amount per colony is generally very small. Accurate bycatch species identification and counts can only be done in a laboratory, and it is unlikely that this information is available for most of the species harvested by marine life fishermen.

There is no visible bycatch among most of the shallow water, photosynthetic species of octocorals. There may be an occasional macro-alga or sponge attached to the substrate that surrounds the base of the octocorals. Experienced harvesters usually collect octocorals in areas where the target species are abundant and they can quickly and easily remove a specimen without damaging any surrounding benthic communities.

Bycatch is slightly more common on some of the deepwater, non-photosynthetic specimens, very little of which are collected in the federal waters of the Florida Keys. Most deepwater octocorals are collected off Broward and Palm Beach counties in state waters. Bycatch associated with deepwater octocorals usually consists of small brittle stars and basket stars, and the number and species composition varies greatly by species, location, and season.

The impact of harvesting octocorals is most likely not discernable. Few fish feed directly on octocorals, and the selective nature of the harvest has very little impact on the overall community. Also, due to the rapid growth of octocorals and their short natural lifespan, there is a rapid population replacement cycle in hardbottom habitats.

3.6.1.2 Special Management Zones (SMZ) off South Carolina

3.6.1.2.1 Economic Description

Commercial
An estimate of commercial effort, ex-vessel values, and trip costs to SMZs off South Carolina is not available due to the relatively large scale used to identify landings in logbook data. However, a description of the commercial snapper grouper and coastal migratory pelagic fisheries off of South Carolina is incorporated by reference from the Comprehensive ACL Amendment (SAFMC in prep) and Amendment 18 to the FMP for the Coastal Migratory Pelagic Resources in the Atlantic and Gulf of Mexico (CMP Amendment 18) (SAFMC & GMFMC in prep), respectively.

Recreational
An estimate of recreational trips and associated expenditures to SMZs off South Carolina is not available. However, a description of the recreational snapper grouper and coastal migratory pelagic fisheries off of South Carolina is incorporated by reference from the Comprehensive ACL Amendment (SAFMC in prep) and CMP Amendment 18 (SAFMC in prep), respectively.

An Economic Impact and Use Survey of South Carolina Artificial Reef Users (**Appendix I**) (Rhodes and Pan 2007) contains relatively recent information on the importance of artificial reefs to South Carolina fishermen. Rhodes and Pan (2007) estimated the total (aggregate) South Carolina private boat fishing trips involving SC permitted marine artificial reef sites by South Carolina licensees during 2006. The projected total number of South Carolina private boat saltwater fishing trips involving permitted marine artificial reefs in 2006 was ~203,400 trips. This estimated number of trips constituted about 49% of all 2006 ocean South Carolina fishing trips presented by the Marine Recreational Fisheries Statistics Survey (MRFSS). Estimates of total annual trips to artificial reefs approximately tripled between 1992 and 2006 while the number of permitted artificial reef areas only doubled during the same time period. Based on primary data collected on charter divers, a total of 3,571 divers participated in charted South Carolina offshore dive trips during 2006 with 53% of these charter divers (1,902 divers) making one or more dives on structures within South Carolina permitted artificial reef sites.

The estimating of economic impacts and economic importance of anglers and charter divers related to the use of South Carolina permitted marine artificial reef sites was predicated upon estimating total (aggregate) annual trip expenditures for each user group (i.e., anglers and charter divers) using their daily trip expenditure averages (means) by major license regions and overnight trips in the South Carolina coastal counties. All of the following values are in 2006 dollars. The mean total daily trip expenditures by private boat anglers making a fishing trip to an South Carolina artificial reef site during a sampled month ranged from $548 for non-coastal anglers staying overnight to about $255 for South Carolina coastal anglers not making overnight trips, and the total mean daily expenditures by non-coastal charter divers staying overnight were $381. The estimated total (aggregate) trip expenditures by private boat anglers and charter divers making trips to artificial reef sites were $28.7 million and $0.6 million, respectively, during 2006. These artificial reef users in 2006 represented an economic impact (i.e. economic importance) of approximately $83 million in total sales (output) that generated approximately 1,000 jobs. It is readily apparent that the South

Carolina marine artificial reef system, as developed and managed by the SCDNR, is a significant component of the entire South Carolina coastal economy. In addition, the man-made structures within South Carolina permitted artificial reef areas, as recreational outdoor "destinations," are an important component of the economic impacts generated by a special group or subset of tourists, i.e. anglers and scuba divers.

3.6.1.2.2 Social and Cultural Environment

Background on Special Management Zones off South Carolina

Development of marine artificial reefs along the South Carolina coast began in the early 1960s, with initial state involvement in reef construction and management beginning in 1967 through the efforts of the South Carolina Wildlife Resources Department (now the South Carolina Department of Natural Resources) with assistance from federal and private sector funding (Bell et al. 1989). In 1973 a Marine Artificial Reef Program within the Recreational Fisheries Section of the Marine Resources Division was established. The program was designed to oversee the continued development and maintenance of a system of artificial reefs constructed for the express purpose of improving saltwater recreational fishing opportunities in South Carolina's coastal and offshore waters.

A detailed survey of saltwater recreational boat anglers conducted in 1977 (Liao and Cupka 1979) determined that the total economic impact of the state's marine artificial reef program was $10.4 million annually, with a direct expenditure by artificial reef fishermen in 1977 alone of $4.94 million. Not only were artificial reefs an effective means of improving fishing success for thousands of sport fishermen, but they were also a sound economic investment with the potential of substantial long-term economic benefit to the state.

In 1983, implementation of the Snapper Grouper FMP (SAFMC 1983) allowed for the eventual establishment of protective regulations for the state's reefs. Management Measure #17 in the Snapper Grouper FMP states:

"Upon request to the Council from the permittee (possessor of a Corps of Engineers permit) for any artificial reef or fish attraction device (or other modification of habitat for the purpose of fishing) the modified area and an appropriate surrounding area may be designated as a Special Management Zone (SMZ) that prohibits or restrains the use of specific types of fishing gear that are not compatible with the intent of the permittee for the artificial reef or fish attraction device. This will be done by regulatory amendment similar to adding or changing minimum sizes (Section 10.2.3)".

Furthermore, the FMP states: "The intent of a SMZ is to provide incentive to create artificial reefs and fish attraction devices that will increase biological production and/or create fishing opportunities that would not otherwise exist. The drawback to investing in artificial reefs or fish attraction devices is that they are costly and have limited advantages that can be rapidly dissipated by certain types of fishing gear (e.g., traps harvesting black sea bass from artificial reefs). Fishing gear that offers 'exceptional advantages' over other gear to the point of

eliminating the incentive for artificial reef and fish attraction devices for users with other types of fishing gear prevent improved fishing opportunities that would otherwise not exist."

The frequency of reported or detected evidence of the use of restricted gear types on South Carolina's SMZs decreased to an insignificant degree by late 1989. However, a new problem arose with recreational anglers using SCUBA gear and powerheads, or "bang-sticks" to harvest large quantities of snapper grouper species, primarily amberjacks, on many of the offshore sites. The South Atlantic Council acted to add powerheads to the list of restricted gears and regulations to this effect were implemented in 1992. Since then, no evidence of large-scale harvesting of amberjack by divers has been reported or encountered.

However, during 2008 and 2009, representatives of South Carolina's recreational fishing community expressed concerns over commercial snapper grouper fishing vessels allegedly operating on several permitted offshore artificial reef sites. Specifically, these recreational constituents felt that the use of conventional spearguns by commercial fishermen to harvest fish on these sites might be harmful to the reef fish populations and was not in keeping with the intended purpose of the reefs. While South Carolina's marine artificial reefs had from the very beginning, due to their size and especially their funding sources, been intended for use by saltwater recreational fishermen only (i.e. hand-held rod and reel anglers), there was a small but growing use of the reefs by commercial fishing interests (particularly black sea bass trap fishermen) since no regulations prohibited this activity.

User Groups

The primary activity in the SMZs is recreational fishing, including both private anglers and for-hire vessels. As mentioned above, South Carolina requires a saltwater recreational license for all recreational fishermen on private boats in the SMZs (licenses are not required for people fishing on charter boats). There are no direct data on recreational fishing in the SMZs so this description will use information from SC saltwater recreational license data. The number of saltwater anglers has more than doubled from 1999 to 2008 (**Figure 3-6**). The number of in-state residents with licenses has increased for both coastal and non-coastal residents, while out-of-state license holders have made up the largest proportion over the period (**Figure 3-6**). Recreational fishing is a growing sector, and is an important part of coastal tourism. Recreational fishing in the SMZs occurs throughout the year with peak activity from May through November.

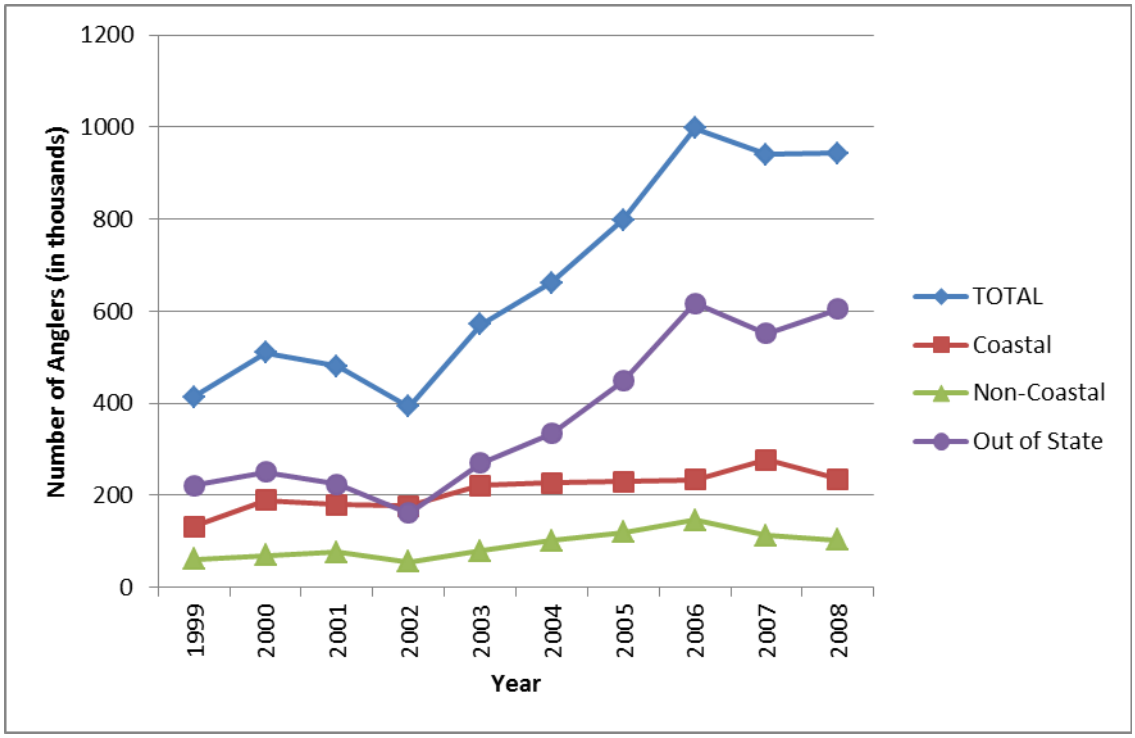


Figure 3-6. South Carolina recreational saltwater license holders by region.

Recreational SCUBA diving is also an important activity in the SMZs, particularly during peak months of May to October. Diving activities include underwater photography, videography, shell collecting, spear fishing and sight- seeing.

Commercial fishing in the SMZs is a small but growing use of the reefs, including black sea bass trap fishermen and, more recently, commercial snapper grouper fishermen harvesting with spear guns. There is little information about commercial fishing within the SMZs. However, members of the recreational fishing community have expressed concern that commercial fishing in the SMZs removes a disproportionate share of the standing fish populations from artificial reefs through the use of commercial-type gear, and would negatively impact overall success and intended purpose of the SMZs.

Communities

Recreational and commercial fishermen target reef fish and pelagic species in the SMZs and this section will focus on communities that are associated with dependence on recreational and commercial fishing from these stocks. More detailed information can be found in Amendment 17B to the Snapper Grouper FMP (SAFMC 2010b) and CMP Amendment 18 (SAFMC & GMFMC in prep). In general, South Carolina coastal communities will be the most directly affected by actions pertaining to SMZs because they represent the private anglers; charter providers; businesses linked to recreational fishing and coastal tourism; and

some commercial fishermen who may fish in the SMZs. More information about other communities in the South Atlantic is available in Jepson et al. (2005).

Available information commercial and for-hire recreational sectors indicate that Murrell's Inlet, Little River, Charleston, and North Myrtle Beach are important fishing communities. Currently there are 100 federal pelagic charter/headboat permits registered in South Carolina and 95 federal snapper grouper charter/headboat permits. Most (88%) vessels with a registered pelagic charter permit also have a snapper grouper charter permit. Of these vessels, over half are registered in four cities: Murrells Inlet, Charleston, Little River, and North Myrtle Beach (**Figure 3-7**).

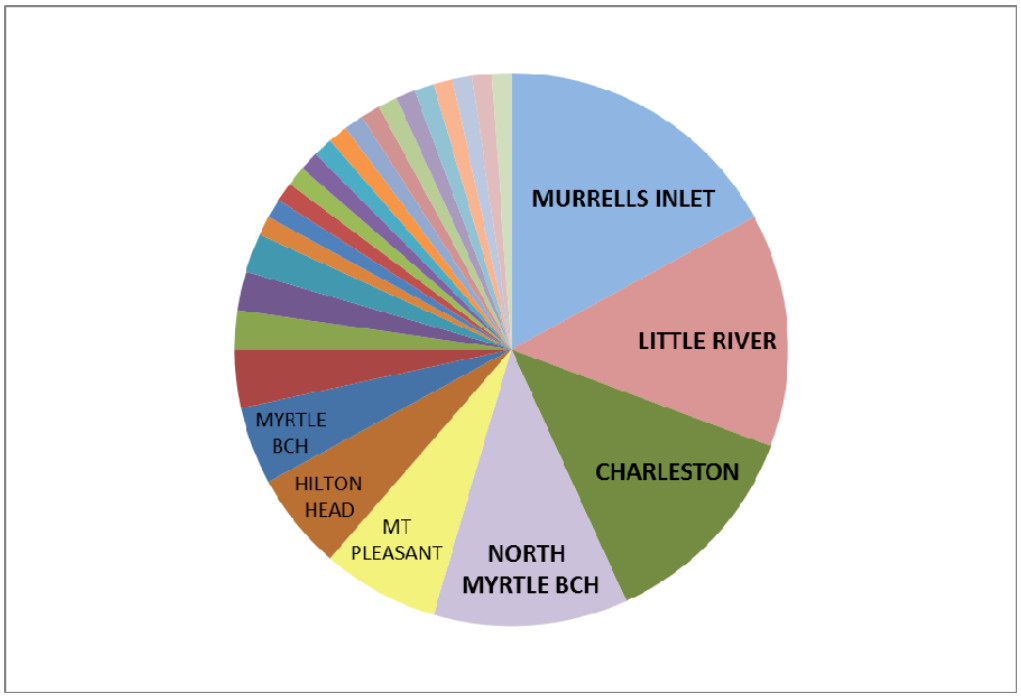


Figure 3-7. Distribution of South Carolina Vessels with both Pelagic and Snapper Grouper federal charter permits.

While pockets of commercial fishing activities remain in the state, most are being displaced by the development forces and associated changes in demographics. Similar to important for-hire recreational communities, commercial activity is concentrated mostly in Little River and Murrell's Inlet, with some commercial fishermen in Charleston and Myrtle Beach. Currently there are 37 vessels with federal commercial permits (snapper grouper, Spanish mackerel, king mackerel), with a majority concentrated in Little River (18) and Murrells Inlet (13). Most vessels have at least two permits and nearly all vessels from Little River and Murrells Inlet have commercial permits for snapper grouper (unlimited), Spanish Mackerel, and King Mackerel. Additionally there are 20 snapper grouper federal dealer permits in South Carolina, with most registered in Little River and Murrells Inlet.

4 Environmental Effects

4.1 Action 1. Modify management of octocorals in the South Atlantic

Alternative 1. No Action. Do not remove octocorals from the fishery management unit (FMU) under the South Atlantic Coral FMP.

Alternative 2. Remove octocorals from the FMU.

Preferred Alternative 3. Modify the FMU to indicate that octocorals are included in the EEZ off NC, SC, and GA.

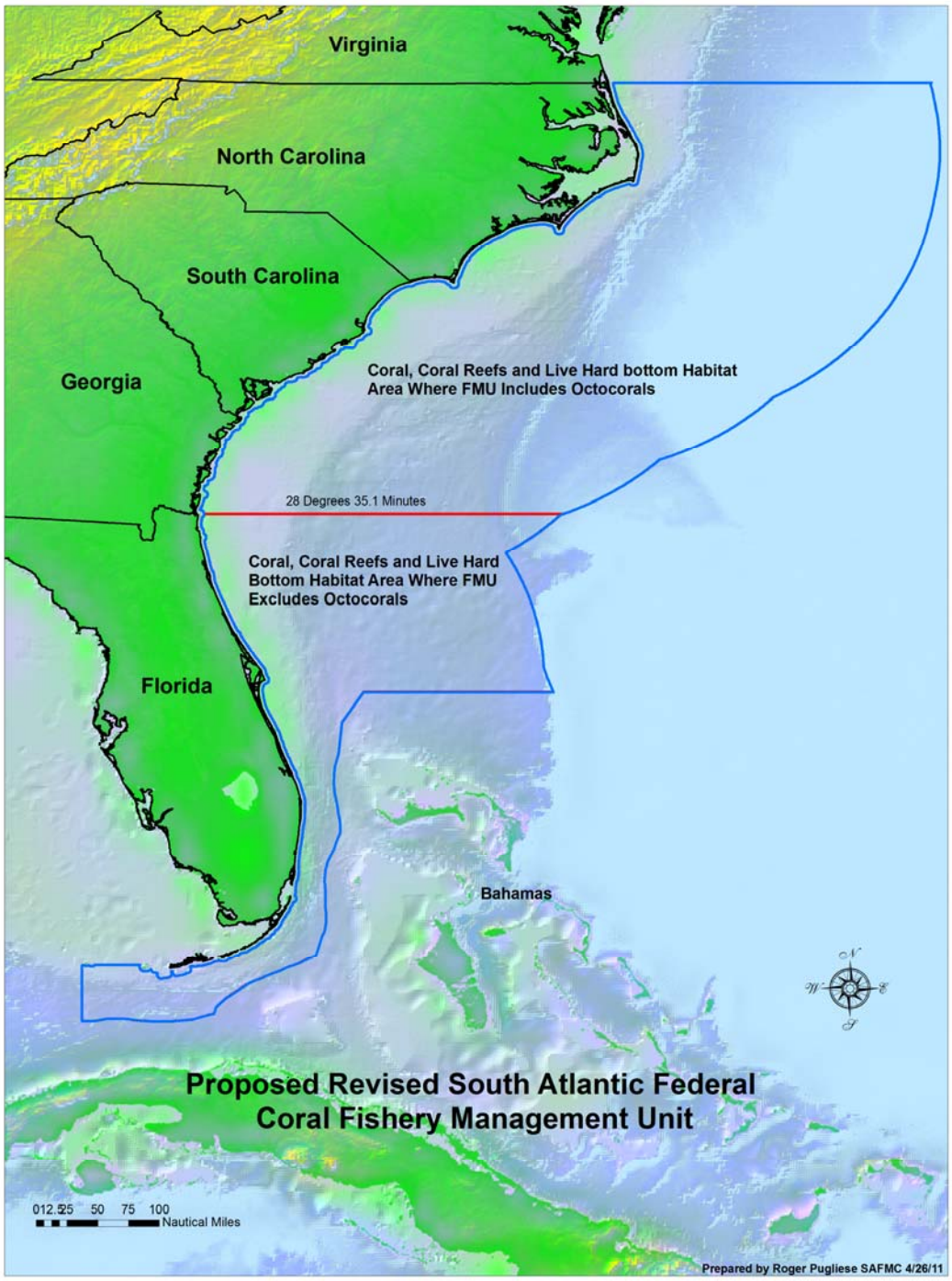


Figure 4-1. Proposed Revised South Atlantic Federal Coral Fishery Management Unit.

4.1.1 Biological Effects

Alternative 1 (No Action) would not remove octocorals from the South Atlantic Coral FMU. Although octocoral harvest is managed under the South Atlantic Fishery Management Council's (South Atlantic Council) Fishery Management Plan (FMP) for Coral, Coral Reefs, and Live/Hardbottom Habitats of the South Atlantic (Coral FMP), the Florida Fish and Wildlife Commission (FWC) is responsible for most of the management, implementation and enforcement of regulations because the majority of the harvest occurs in state waters. In 1990, Amendment 1 to the Coral FMP (SAFMC & GMFMC 1990) established a total allowable harvest for commercial harvesters of octocorals as 50,000 colonies annually. It also established commercial permits, reporting requirements, and a six-colony recreational bag limit for octocorals. These regulations were consistent with regulations adopted in Florida waters. Currently, there is a prohibition of harvest of octocorals off Georgia, South Carolina, and North Carolina.

Octocorals are included in Florida's Marine Life Fishery which consists of the commercial and recreational harvest of more than 600 species of live saltwater fish, invertebrates, and plants. These organisms are collected primarily for aquaria. Commercially, organisms are collected and sold live to wholesalers, retailers, and aquarium owners. It is estimated that 800,000 U.S. households maintain marine fish in aquariums as pets. The commercial marine life fishery also supplies public and private marine aquariums, which are important in promoting marine conservation and education, especially about coral reefs and their associated species. The domestic collection of many of these species is limited to Florida, Hawaii, and California. Unlike many of the other marine fisheries that FWC manages, there are no stock assessments and very little biological information available for many marine life species.

Florida's management strategy for this fishery is to limit the number of harvesters in the commercial fishery and use an aggregate daily bag limit for the recreational harvesters. For species that need additional protection, more stringent bag limits, vessel limits, size limits, gear restrictions, substrate restrictions, etc. are applied. Soft corals, except for the common sea fan (*Gorgonia flavellum*) and Venus sea fan (*G. ventalina*), are designated as a restricted species in the FWC's marine life rule (68B-42 of the Florida Administrative Code). This means that commercial harvesters must hold a valid restricted species endorsement (in addition to a saltwater products license and marine life endorsement) to harvest octocorals. In Florida waters, one of two marine life endorsements is required to be able to dive to harvest octocorals, a marine life transferable dive endorsement, or a marine life non-transferable dive endorsement. As of 2010 data, there are 130 active ML dive endorsement licenses (Florida FWC, Division of Marine Fisheries Management Office). Octocorals are defined in the FWC marine life rule as any erect, nonencrusting species of the Subclass Octocorallia, except for the common sea fan and Venus sea fan. Harvest of these sea fans is prohibited in Florida waters. There are no commercial limits for octocorals in Florida waters. However, FWC rules state that the commercial harvest of octocorals shall close in state waters if the harvest of octocorals in adjacent federal waters is closed. Harvest of substrate within one inch of the perimeter of the holdfast at the base of the octocoral is allowed as long

as the substrate remains attached to the octocoral. All commercial marine life landings in Florida are required to be recorded using Florida's commercial trip ticket system.

Trip tickets allow the FWC to monitor commercial harvest and effort through time and by location. Each trip ticket contains detailed information about the harvest including the date and location, types and quantities of organisms harvested, gear used, and the price of each organism. A trip ticket must be filled out by a wholesale dealer every time a marine life collector lands their harvest, and in many cases, marine life collectors also serve as their own wholesale dealer. Landings of marine life species are recorded on trip tickets using a list of codes unique to a particular species, genus, or taxonomic group. Nearly 400 different codes are used by the FWC for reporting marine life landings. The FWC provides a special trip ticket form to collectors and wholesale dealers for recording marine life landings, but collectors may also create their own trip ticket forms. Such forms must be approved by the FWC before they are used to record landings. The location from which organisms are harvested is reported on each trip ticket using a "fishing area code." For reporting purposes, the waters off Florida are divided into several "fishing areas." Each fishing area has separate codes for sub-regions within the area such as bays, offshore waters, and federal waters. For example there are ten different fishing area codes for the Florida Keys and nine different fishing area codes for waters off Miami-Dade County. Reporting harvest locations accurately is important, especially when regulations or quotas differ by region (e.g., state waters vs. federal waters). As such, octocoral harvests from separate locations on the same day should be reported on separate trip tickets, but this does not always happen. Such misreporting results in less reliable information about harvest locations and could affect region-specific quotas.

There are at least 40 different species of octocorals found off Florida and three trip ticket codes for reporting octocorals. Individual octocoral species do not have unique codes; however, the codes used are based on species commonly or historically harvested and trade demand. Many octocoral species are difficult to distinguish from each other, so creating unique codes for each species could result in misreporting and make reporting too cumbersome for marine life collectors.

Alternative 2 would remove octocorals from the FMU, eliminating any existing management measures in federal waters such as a permit and quota. Although the FWC may adopt the management of octocorals off of Florida, there would be no protection of the resource in federal waters outside of Florida. **Alternative 2** would result in the elimination of the current prohibition of octocoral harvest off Georgia, South Carolina and North Carolina. Additionally, during their October 2010 meeting, the Gulf of Mexico Fishery Management Council (Gulf Council) selected a preferred alternative to remove octocorals from their Fishery Management Plan for Corals and Coral Reefs of the Gulf of Mexico (Gulf Coral FMP) as a result of FWC expressing an interest in managing the fishery in the Gulf EEZ off FL. However, currently the only harvest of octocorals in the Gulf of Mexico is off of Florida and this fishery is monitored and enforced by the FWC. Thus, development of a fishery off other Gulf states seems unlikely.

Furthermore, Essential Fish Habitat (EFH) was designated for octocorals, a designation that would be withdrawn if they are removed from the management unit. Under **Alternative 2**, harvest of octocorals would be allowed in the five deepwater coral habitat areas of particular concern (HAPC) designated in CE-BA 1 (SAFMC 2010), and the *Oculina* Bank HAPC.

Preferred Alternative 3 would revise the FMU to include octocorals off Georgia, North Carolina and South Carolina (**Figure 4-1**). Octocorals in federal waters off Florida would be removed from the Coral FMP and would result in no federal management. As explained in the description of **Alternative 1**, although octocoral harvest is managed under the South Atlantic Council's Coral FMP and subsequent amendments, the FWC is responsible for most of the management, implementation and enforcement of regulations because the majority of the harvest occurs in state waters. In a letter dated, April 11, 2011, the FWC describes management measures it will implement with regards to octocorals if the South Atlantic Council proceeds with **Preferred Alternative 3** (**Appendix M**). FWC intends to extend Florida octocoral regulations into federal waters off of Florida, establish an annual quota for allowable octocoral harvest in state and federal waters off Florida, and prohibit harvest of octocorals north of Cape Canaveral and in the Coral HAPCs adjacent to Florida waters. **Action 1, Preferred Alternative 3** combined with **Action 3, Preferred Alternative 3** will result in the same biological protection to the resource as is currently implemented.

National Standard 3 (NS 3) of the Magnuson-Stevens Fishery Conservation and Management Act states: "To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination." The guidelines provide basis for a fishery management unit to be identified around a geographic area (50 C.F.R. § 600.320(d)(2)). In the case of **Preferred Alternative 3**, alternative management exists under FWC's Marine Life Fishery Program, and the state has indicated via letter dated April 11, 2011, of their intent to extend management measures for the octocoral fishery into federal waters off Florida (**Appendix M**). **Preferred Alternative 3** would allow the South Atlantic Council to remove management for octocorals off Florida where management by the state of Florida will exist, a modification that also considers efficiency in the utilization of resources (Magnuson-Stevens Act, National Standard 5). National Standard 5 guidelines state: "Given a set of objectives for the fishery, an FMP should contain management measures that result in as efficient a fishery as is practicable or desirable (C.F.R. § 600.330 (b))."

4.1.2 Economic Effects

Under **Alternative 2**, octocorals would not be protected in federal waters by commercial or recreational management measures such as a permit or quota unless Florida extends their jurisdiction into federal waters. If the FWC extends their jurisdiction, Florida waters can be protected and no short or long-term changes will be expected with regard to economic effects in Florida waters. If Florida does not extend their jurisdiction into federal waters, landings would be allowed to increase in federal waters, although, as stated above, the market for octocorals would limit harvest. In this case, due to the possible increased risk of overfishing octocorals under **Alternative 2**, long-term economic benefits would be expected to decrease

compared to **Alternative 1**. Short-term economic benefits could increase if the market demand for octocorals increases.

However, if Florida does extend their jurisdiction into federal waters, concerns would only exist for federal waters north of Florida. However, the species of concern are not generally harvested in waters north of Florida. Regardless, without federal management in waters north of Florida, long-term economic effects would be expected to decline under **Alternative 2** compared to **Alternative 1**.

Under **Preferred Alternative 3**, octocorals will be partially removed from the South Atlantic FMP and would therefore not be protected in federal waters off of Florida (**Figure 4-1**) while harvest of octocorals in waters off of the other South Atlantic states would remain within the South Atlantic FMP. If the FWC extends their jurisdiction to cover both state and federal waters, as they are expected to do, no short or long-term changes would be expected with regard to economic effects resulting from this action since Florida would take over management of these areas. Management measures would be expected to be equivalent to or exceed current management measures in place.

4.1.3 Social Effects

The social effects from removal of octocorals from the FMP are mostly indirect, and pertain to the potential costs and benefits of removing federal management. The costs would likely stem from the risk that federal management would not be replaced with management from a state or other agency. In this case, there could be long-term negative social effects (from harvesters to consumers to the general public) if the stock declined. The beneficial social effects would include more local management and streamlined decision-making.

The social effects from **Alternative 1**, which makes no changes to the FMP and maintains the South Atlantic Council management of octocorals, will result from the subsequent requirement for the South Atlantic Council to set an ACL for octocoral harvest. The ACL would require federal monitoring, an additional burden to management. **Alternative 1** will have little or no impact on Georgia, South Carolina, and North Carolina because there are no harvesters in these areas (harvesting is prohibited north of Cape Canaveral, Florida).

Alternative 2 removes all present and future management measures to octocorals, and social effects are different for Florida than for Georgia, South Carolina, and North Carolina. For Florida, implications for this alternative mostly depend on the FWC extending management into the EEZ. If Florida does not assume management or does not maintain current measures, there may be long-term negative effects for individuals and communities affiliated with harvesting if octocorals decline. If Florida takes over management of octocorals, the streamlined, more localized management will produce long-term social benefits and is not expected to have negative short-term effects on harvesters (and affiliated dealers, communities, and consumers). In regards to Georgia, South Carolina, and North Carolina, removal of federal management for protection of octocorals in **Alternative 2** may cause long-term negative social impacts if the stock declines due to lack of regulations.

Maintaining federal management of octocorals in the EEZs of only Georgia, South Carolina, and North Carolina in the FMP (**Preferred Alternative 3**) will also have different social effects in Florida than in Georgia, South Carolina, and North Carolina. The alternative removes octocorals in the Florida EEZ from the FMP, which will result in similar effects as in **Alternative 2**: long-term social benefits as long as Florida assumes management and provides the same level of protection. For Georgia, South Carolina, and North Carolina, **Preferred Alternative 3** will have similar outcomes as in **Alternative 2**, in that federal management measures will remain in place including establishment of an ACL for octocorals, and have little or no social effects on these areas.

4.1.4 Administrative Effects

Alternative 1 would not result in increased administrative impacts from the status quo. The octocoral fishery is currently operating under a 50,000 colony quota, which would close in the quota is reached in federal waters. This quota and associated closure are the ACL and AM for the fishery. The quota was implemented in Coral Amendment 1 (1990) and mechanisms for reporting, monitoring and enforcement have been established. **Alternative 1** is not expected to result in an increased administrative burden. **Alternative 2** would lessen the administrative burden on the agency as management of these species would no longer be necessary. However, if the need for federal management of octocorals were to arise in the future, the administrative burden of including them in the FMU could result in a significant administrative burden. **Preferred Alternative 3** combined with **Action 3, Preferred Alternative 3**, would essentially result in the same management situation as the status quo but would be a more direct management strategy.

4.1.5 Conclusion

The Coral Advisory Panel reviewed CE-BA 2 during February 2011. Comments were received indicating the Coral AP's interest in keeping octocorals in the management unit, and concern about lack of protection for octocorals if removed from the FMU under the Coral FMP. **Alternative 3** was developed and voted as the South Atlantic Council's preferred alternative during the March 2011 meeting. Following the March 2011 South Atlantic Council meeting, the Coral AP was mailed a revised version of CE-BA 2 and a few comments were received in support of **Preferred Alternative 3**.

The Habitat Advisory Panel reviewed CE-BA 2 during their November 2010 meeting and expressed concern about implications to habitat in areas north of Florida if octocorals were removed entirely from the Coral Fishery Management Plan (FMP). They recommended the South Atlantic Council maintain a level of protection for octocorals under the Coral FMP.

The Law Enforcement Advisory Panel reviewed CE-BA 2 during their August 2009 and March 2011 meetings, and did not provide a specific recommendation for this action.

The SSC reviewed CE-BA 2 during their November, 2010 and April 2011 meeting, and did not provide a specific recommendation for this action.

During the September 2010 South Atlantic Council meeting, this action was restructured from the previous action to transfer management authority of the octocoral fishery to Florida. Florida Fish and Wildlife Conservation Commission (FWC) has expressed an interest in managing the octocoral fishery under their already existing program in place in Florida State waters (FWC's Marine Life Fishery Program), however Florida has not been interested in a transfer of management which would carry requirements under the Magnuson-Stevens Act.

During the December 2010 South Atlantic Council meeting, based upon input from the Coral and Habitat Advisory Panels, Alternative 1 was selected as preferred, to continue current protections for octocorals under the Coral FMP. The South Atlantic Council was concerned that **Alternative 2** would eliminate all protections in place for octocorals in areas north of Florida, where octocorals comprise a more significant component of the live/hardbottom habitat.

NOAA General Counsel advised during the March 2011 South Atlantic Council meeting that the management unit for octocorals could likely be shortened to include the EEZ off North Carolina, South Carolina, and Georgia. Therefore, **Alternative 3** was developed and selected as preferred. Modifying the management unit for octocorals allows the South Atlantic Council to maintain current protections under the South Atlantic Coral FMP in EEZ waters off North Carolina, South Carolina, and Georgia. Under this alternative, management of octocorals in Florida EEZ waters will be removed, thus allowing the FWC to solely manage the fishery through their existing management program. FWC has expressed intentions to extend state regulations under their Marine Life Fishery Program into federal waters off of Florida (for vessels registered in Florida and vessels landing octocorals in Florida) (**Appendix M**).

Based upon National Standards 3 and 5 of the Reauthorized Magnuson-Stevens Act and the associated guidelines (50 C.F.R. § 600.320, § 600.330), the South Atlantic Council concluded that **Preferred Alternative 3** best meets the objectives for management of the octocoral fishery as specified in the Coral FMP while minimizing, to the extent practicable, adverse social and economic effects and is a reasonable alternative for this action.

4.2 Action 2. Extend the SAFMC's Fishery Management Unit for octocorals into the Gulf of Mexico Fishery Management Council's area of jurisdiction

Preferred Alternative 1. No Action. Do not extend the FMU for octocorals into the GMFMC's jurisdiction.

Alternative 2. Extend the management boundaries for all octocorals species in the Coral FMP to include the GMFMC jurisdiction.

4.2.1 Biological Effects

Currently, the quota for octocorals is 50,000 colonies combined in the Gulf of Mexico and South Atlantic EEZ. Harvest of octocorals is prohibited north of Cape Canaveral, Florida.

Preferred Alternative 1 (No Action) would continue this quota and would maintain the current biological impacts to the resource. At its October 2010 meeting, the Gulf Council selected as a preferred alternative to remove octocorals from their Fishery Management Plan for Corals and Coral Reefs of the Gulf of Mexico (Gulf Coral FMP). Currently, the only harvest of octocorals in the Gulf of Mexico is off of Florida and this fishery is monitored and enforced by the FWC. The preferred alternative under Action 1 would allow the FWC to monitor the octocoral quota in state and federal waters off Florida. This could relieve any difficulties in monitoring and enforcing the joint South Atlantic and Gulf of Mexico federal quota under **Preferred Alternative 1**. Under **Preferred Alternative 1**, harvest in any of the other Gulf states could not be controlled if a fishery were to develop leaving populations vulnerable to overexploitation. Therefore, adoption of **Preferred Alternative 1 (No Action)** could have negative biological effects on the octocoral resource. However, octocorals are not as abundant in the other Gulf states as in the Florida Keys (SAFMC & GMFMC 1982). Therefore, development of a fishery for octocorals in other Gulf states does seem unlikely.

Under **Alternative 2**, the South Atlantic Council's management jurisdiction of octocorals would extend throughout the EEZ in the Gulf of Mexico. Under this alternative, the 50,000 colony quota would still apply to octocoral harvest in the Gulf of Mexico and the South Atlantic EEZ and would not result in increased negative biological impacts to the resource. Furthermore, **Alternative 2** would allow for the collection of data including harvest level, development of monitoring programs, a more accurate description of the magnitude of octocoral populations, and better enforcement in federal waters of the Gulf of Mexico, if necessary. **Preferred Alternative 1** and **Alternative 2** refer only to who manages the fishery and would not change the quota or the management mechanism currently in place.

4.2.2 Economic Effects

Given the **Preferred Alternative 3** under **Action 1** to shorten the management unit to encompass North Carolina, South Carolina, and Georgia federal waters only, **Alternative 1 (Preferred)** under this action has been chosen as preferred, which allows Florida to manage Atlantic and Gulf federal waters off of Florida. It is presumed that Florida will extend their management jurisdiction to include federal waters off of Florida and that the management measures implemented by Florida would presumably mirror those already in place or improve upon them. Extension of the FMU (**Alternative 2**) for octocorals into the Gulf Council's jurisdiction is largely an administrative action and there are no direct economic effects. There are no expected changes to long-term economic effects as a result of **Alternative 2** compared to **Preferred Alternative 1** since both protect octocorals to the same degree. As stated above, **Preferred Alternative 1** and **Alternative 2** refer only to who manages the fishery and would not change the quota or the management mechanism currently in place.

4.2.3 Social Effects

Because the preferred alternative in Action 1 removes octocorals in the Florida EEZ from the South Atlantic Council's Coral FMP, the alternatives in Action 2 are linked and presumably have the same outcome: the FWC would extend management of octocorals into federal

waters on the South Atlantic and Gulf sides of the state. There would be no expected direct social costs or benefits to **Preferred Alternative 1 (No Action)** or **Alternative 2**. Either alternative would ultimately allow Florida to assume octocoral management, which likely would produce long-term social benefits as discussed in Section 4.1.3.

4.2.4 Administrative Effects

The administrative impacts of **Preferred Alternative 1** would not change from the status quo. Under **Alternative 2**, the South Atlantic Council must first remove octocorals from their Coral FMP and request the Secretary of Commerce to designate management of octocorals to the South Atlantic Council. The administrative impacts of **Alternative 2** would be increase slightly from those of **Preferred Alternative 1.**

4.2.5 Conclusion

The Coral Advisory Panel reviewed this Action during February 2011. Comments were received from several members in support of **Alternative 2** as preferred. The Coral AP was also mailed a revised version of CE-BA 2 after **Alternative 1** was selected as the South Atlantic Council's preferred in March 2011 (as a result of this action being linked to the South Atlantic Council's decisions with the previous action and alternatives), and no specific recommendations were received.

The Habitat Advisory Panel reviewed CE-BA 2 during their November 2010 meeting. Based upon limited analysis at the time of their meeting, the Habitat AP recommended **Alternative 1** as preferred.

The Law Enforcement Advisory Panel reviewed CE-BA 2 during their March 2011 meeting, and did not provide a specific recommendation for this action.

In February 2010, the Gulf of Mexico Council submitted a letter to Florida Fish and Wildlife Conservation Commission (FWC) indicating potential changes to how they manage the octocoral fishery under the Gulf Coral FMP. They requested Florida to consider a transfer of management of the octocoral fishery from the Gulf Coral FMP. Under the Gulf of Mexico Council's Generic ACL Amendment, various alternatives are being considered: remove octocorals from the Gulf Coral FMP, transfer management of the Gulf octocoral fishery to the FWC, or remove octocorals from the Gulf Coral FMU and request the Secretary of Commerce to designate the South Atlantic Council as the responsible Council for managing the fishery. FWC responded to the Gulf of Mexico Council's request in March 2010, indicating their interest in possibly managing the octocoral fishery. They responded again to the Gulf of Mexico Council in August 2010 stating they were prepared to manage the fishery in state waters and federal waters adjacent to Florida. In the Generic ACL Amendment, the Gulf of Mexico Council has selected as a preferred alternative to remove octocorals from the Gulf Coral FMP as a result of FWC's interest in managing the fishery.

At the June 2010 South Atlantic Council meeting, this management measure was adopted as an action in CE-BA 2 based upon the alternatives included in the Gulf of Mexico Council's

Generic ACL Amendment. In December 2010, the South Atlantic Council selected **Alternative 2** as preferred as a result of the Gulf of Mexico Council's plans to remove octocorals from the Gulf Coral FMP. The South Atlantic Council also discussed an interest in maintaining some level of protection for octocorals in the Gulf EEZ under the South Atlantic Coral FMP. During the March 2011 meeting, based upon the FWC's interest in solely managing the fishery in Florida state and adjacent federal waters, and the South Atlantic Council moving towards modifying the management unit for octocorals to include them in the EEZ off North Carolina, South Carolina, and Georgia as described in Action 1, **Preferred Alternative 3**, the South Atlantic Council selected **Alternative 1** as their preferred. **Preferred Alternative 1** best meets the objectives of the Coral Fishery Management Plan, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

4.3 Action 3. Modify the Annual Catch Limit (ACL) for octocorals in the South Atlantic

Alternative 1. No Action. Do not modify the existing ACL for octocorals in the South Atlantic (ACL=current 50,000 colony quota for South Atlantic and Gulf of Mexico EEZ).

Alternative 2. Modify the existing ACL in the South Atlantic and Gulf of Mexico (ACL=current 50,000 colony quota for South Atlantic and Gulf of Mexico EEZ) to include State waters.

Preferred Alternative 3. ACL = 0 for octocorals in EEZ off NC, SC, and GA.

4.3.1 Biological Effects

At their August 2010 meeting, the South Atlantic Council's SSC reviewed and discussed background information on octocoral landings, life history, and possible fishery reference points. The SSC recommended no changes to the current quota of 50,000 colonies annually for the Gulf of Mexico and South Atlantic EEZ because: the fishery is small and effort/participation in Florida waters is capped by a limited entry program; there are no signs of local depletion in areas where the fishery operates; and there are no other indications that the fishery has been operating at unsustainable levels. During their November 2010 meeting, the SSC revisited their ABC recommendation for octocorals and clarified their intent for the value to include Gulf of Mexico and South Atlantic EEZ and state waters combined, annually.

Alternative 1 (No Action) would continue to manage octocorals with the 50,000 colony quota and would not account for landings in state waters. The FWC has implemented compatible regulations which closes the state octocoral fishery when the federal quota is met, however, that quota has never been reached and the state fishery for octocorals has never been closed (**Tables 4-1** and **4-2**).

Table 4-1. Landings (colonies) of octocorals in the Gulf and South Atlantic EEZ.

Year	*Gulf Landings*	*South Atlantic Landings*	*Total Landings*
2000	3,975	7,278	11,253
2001	3,728	5,432	9,160
2002	2,707	10,407	13,114
2003	4,331	5,049	9,380
2004	2,966	4,386	7,352
2005	3,693	4,007	7,700
2006	2,721	4,024	6,745
2007	5,747	5,250	10,997
2008	4,951	4,890	9,841
2009	3,863	3,509	7,372

Source: Landings data FL FWC, FWRI

Alternative 2 would modify the existing ACL for octocorals to include landings from the Gulf of Mexico and South Atlantic EEZ as well as landings in state waters. The majority of the octocoral harvest occurs in state waters off of Florida. Landings off states in the Gulf of Mexico and South Atlantic have not exceeded the 50,000 colony quota but have come fairly close to meeting that quota (**Table 4-1**). Under **Alternative 2**, the octocoral fishery in federal waters would close when harvest of octocorals in state and federal waters reached 50,000 colonies. Harvest of octocorals in state waters would close upon reaching the ACL if the FWC adopted compatible regulations. There is currently minimal harvest of octocorals in state waters off of any other Gulf state (other than Florida state waters) (**Table 4-2**), and harvest of octocorals in the South Atlantic is prohibited north of Cape Canaveral, Florida.

Table 4-2. Landings (colonies) of octocorals in State waters.

Year	*Gulf Landings*	*South Atlantic Landings*	*Total Landings*
2000	5,492	26,355	31,847
2001	7,110	29,624	36,734
2002	6,056	18,968	25,024
2003	5,336	29,768	35,104
2004	7,067	29,339	36,406
2005	6,351	27,401	33,752
2006	6,233	35,589	41,822
2007	3,451	29,824	33,275
2008	4,421	28,230	32,651
2009	3,103	20,784	23,887

Source: Landings data FL FWC, FWRI

The biological effect of **Alternative 2** would be greater than **Alternative 1** since there would be greater assurance that the ACL would not be exceeded and overfishing would not occur.

Combined landings for state and federal waters in the Gulf of Mexico and South Atlantic have not reached the 50,000 colony quota but may in the future (**Table 4-3**). **Alternative 2** would allow more protection to the resource by considering state landings towards the quota.

Table 4-3. Landings (colonies) of octocorals in both Federal and State waters.

Year	*Combined State Landings*	*Combined Federal Landings*	*Total Landings*
2000	31,847	11,253	43,100
2001	36,734	9,160	45,894
2002	25,024	13,114	38,138
2003	35,104	9,380	44,484
2004	36,406	7,352	43,758
2005	33,752	7,700	41,452
2006	41,822	6,745	48,567
2007	33,275	10,997	44,272
2008	32,651	9,841	42,492
2009	23,887	7,372	31,259

Source: Landings data FL FWC, FWRI

Preferred Alternative 3 would establish an ACL equal to 0 for the octocoral fishery. This action is dependent on the alternatives in Action 1. If **Action 1, Alternative 1** is selected, **Preferred Alternative 3** would result in no harvest of octocorals in the South Atlantic. The current 50,000 colony quota would be eliminated. This would eliminate the fishery for octocorals in the South Atlantic and would provide an increase in biological benefits to the stock. If **Action 1, Alternative 2** is selected, **Preferred Alternative 3** would have no relevance. **Action 1, Alternative 2** would remove octocorals from the FMU and once removed the species would not be subject to federal management. Specification of an ACL would be a moot point. If **Preferred Alternative 3**, under Action 1 is selected, the ACL=0 would only apply to octocoral harvest north of Florida. Currently, there is a prohibition of harvest north of Florida and this would continue under this alternative. The biological impacts to the resource would remain the same as the status quo. It is expected the FWC would continue to manage octocorals in Florida and would continue to implement the 50,000 colony quota in State waters.

Neither **Alternative 1**, **Alternative 2,** or **Preferred Alternative 3** is expected to have any impacts on protected species in the area.

4.3.2 Economic Effects

Landings in state and federal waters have never exceeded the **Alternative 2** proposed ACL of 50,000 colonies and therefore, there are no expected short-term economic losses to fishermen of implementation of the 50,000 quota as the ACL. However, there could be an economic loss suffered by fishermen who have made investments toward expanding harvest operations in the future. Also, in the case where state and federal landings of octocorals are

underreported, economic losses could occur. However, this cannot be quantified because there is no record that this is occurring.

Because there are no landings of octocorals occurring in federal waters north of Florida, and harvest of octocorals is prohibited north of Cape Canaveral, Florida, the **Preferred Alternative 3** (ACL = 0) is not expected to result in any negative economic effects.

4.3.3 Social Effects

In general, a more restrictive ACL would result in short-term negative impacts on octocoral collectors if harvest is reduced or stopped once an ACL is met or projected to be met. However, similar to the last two actions, Action 3 would have different outcomes for Florida than for other regions; is linked to preferred alternatives of Actions 1 and 2; and is contingent on Florida assuming management of octocorals.

In regards to Florida, **Alternative 1, Alternative 2,** and **Preferred Alternative 3** would have little or no social effects as long as Florida assumes management of octocorals and continues the same level of octocoral protection. For Georgia, South Carolina, and North Carolina, which under Action 1 would be the EEZs subject to the ACL set in this action, **Alternative 1**, **Alternative 2** and **Preferred Alternative 3** would likely result in no negative social impacts on harvesters (and affiliated dealers, communities, and consumers) because octocoral harvest is prohibited north of Cape Canaveral, Florida. Overall, **Preferred Alternative 3** would likely lead to long-term social benefits due to maximum protection (ACL=0) of octocorals in the EEZ off of Georgia, South Carolina, and North Carolina.

4.3.4 Administrative Effects

Specifying an ACL alone will not increase the administrative burden over the status-quo. However, the monitoring and documentation needed to track the ACL can potentially result in a need for additional cost and personnel resources if a monitoring mechanism is not already in place. The quota for the octocoral fishery was implemented in 1990 (Coral FMP Amendment 1; GMFMC & SAFMC 1990) and reporting mechanisms have been established. Under **Alternative 2**, it is more likely that harvest will come close to reaching the ACL than **Alternative 1** and the fishery may be closed as a result. This could result in a higher administrative burden due to outreach and education, increased monitoring and enforcement.

4.3.5 Conclusion

The Coral Advisory Panel reviewed CE-BA 2 during their September 2009 meeting. They provided a number of recommendations for specifying ABC, OFL, and ACL based upon existing levels of harvest. Their recommendations to the Council were based upon different options under MSY established at 50,000 colonies; 11,000 colonies; 49,170 colonies; and 30,000 colonies. The South Atlantic Council removed the actions specifying MSY, OFL, ABC, and AMs from the document as a result of existing values within previous Coral FMP amendments found to be equivalent to the required values under the Magnuson-Stevens Act. These actions were subsequently placed within the Considered but Eliminated Appendix

(**Appendix F**). The Coral AP reviewed a revised CE-BA 2 in February 2011 and comments were received from several AP members supporting the inclusion of state waters in the federal quota (ACL) for the octocoral fishery. The Coral AP was also mailed a version of CE-BA 2 in March 2011 after the South Atlantic Council developed **Alternative 3** and selected it as preferred. Comments were received in support of **Alternative 3**, contingent upon Florida Fish and Wildlife Conservation Commission (FWC) maintaining the same biological level of protection to the octocoral fishery in FL state and adjacent federal waters.

The Habitat Advisory Panel reviewed CE-BA 2 during their November 2010 meeting, and agreed with the SSC's recommended ABC value.

In August 2010, the SSC met to further develop ABC recommendations for data-poor stocks, including octocorals. They discussed the fact that there is no stock assessment for octocorals, and landings information for this fishery is limited. Based upon the number of licensed fishery participants, and the magnitude of landings, they considered the fishery to be 'small' and recommended an ABC value of 50,000 colonies, annually, that is also consistent with the octocoral quota. The SSC clarified during their November 2010 meeting the ABC recommendation for octocorals included landings in the Gulf of Mexico and South Atlantic EEZ and state waters, combined. In April 2011, the SSC reviewed new alternatives developed during the March 2011 South Atlantic Council meeting, including **Alternative 3**, to set the ACL equal to 0 for octocorals in the EEZ off North Carolina, South Carolina, and Georgia. Based upon the South Atlantic Council's interest to shorten the management unit for octocorals to include them in the South Atlantic Coral FMP in the EEZ off North Carolina, South Carolina, and Georgia, the SSC had no objections to setting the ACL equal to 0 in the geographic area where harvest of octocorals is already prohibited.

At the September 2010 meeting, the South Atlantic Council approved a motion to develop **Alternative 2** to include state landings in the federal quota for octocorals. The South Atlantic Council discussed that octocorals are predominantly harvested in Florida state waters, and thus landings should be accounted for in the annual quota for the fishery. However, after receiving legal guidance during the March 2011 South Atlantic Council meeting that the octocoral FMU under the South Atlantic Coral FMP might be shortened to include EEZ waters off North Carolina, South Carolina, and Georgia, the Council developed **Alternative 3** and selected this as preferred. Under the South Atlantic Coral FMP, there is a prohibition of harvest of octocorals north of Cape Canaveral, Florida. Shortening the management unit keeps protections in place for octocorals under the Coral FMP in the South Atlantic where harvest is prohibited. Thus, based upon the rationale for selecting **Alternative 3** in Action 1 as preferred, the South Atlantic Council selected **Alternative 3** as preferred for this action. **Preferred Alternative 3** also best meets the objectives of the Coral Fishery Management Plan, as amended, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

4.4 Action 4. Modify management of Special Management Zones (SMZs) off South Carolina

Alternative 1. No Action. Do not modify the current management of SMZs off South Carolina.

Preferred Alternative 2. Limit harvest and possession of snapper grouper species (with the use of all non-prohibited fishing gear) in SMZs off South Carolina to the recreational bag limit.

Preferred Alternative 3. Limit harvest and possession of coastal migratory pelagic species (with the use of all non-prohibited fishing gear) in SMZs off South Carolina to the recreational bag limit.

Alternative 4. Prohibit use of hand spear and spear guns in SMZs off South Carolina.

4.4.1 Biological Effects

The Army Corps of Engineers permits the South Carolina Department of Natural Resources (SCDNR) to construct, maintain and manage the state's artificial reefs (**Figure 4-2**, and **Figure 4-3**). Artificial reefs off South Carolina are located on an expansive shelf area largely devoid of any hard or live bottom. The artificial reefs were built to promote recreational fishing and were not sited on live bottom in order to avoid any impact to commercial fisheries. The artificial reefs have been promoted since their original construction as recreational fishing areas (SAFMC Snapper Grouper Monitoring Team Report #5,1992) and the South Carolina Marine Artificial Reef Program is financially supported primarily by the recreational community through South Carolina's Saltwater Recreational Fishing License Program and the Federal Aid in Sportfish Restoration Program (**Appendix H).**

In the EEZ off South Carolina, almost all of the artificial reefs (**Figure 4-2**, and **Figure 4-3**) are managed as special management zones (SMZs) under the FMP for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP) to protect these relatively small reef communities from the effects of overly-efficient fishing practices. The South Atlantic Council has designated SMZs as Essential Fish Habitat – Habitat Areas of Particular Concern (EFH-HAPC). The development and protection of these habitats from gear impacts and excessive harvest by highly efficient gear types promotes conservation and enhances protection of EFH and EFH-HAPCs in the South Atlantic region (Snapper Grouper Regulatory Amendment 8, SAFMC 2000).

The use of certain types of fishing gear within the boundaries of the SMZ reefs is prohibited. Regulatory Amendment 7 to the Snapper Grouper FMP restricted fishing on the SMZs to handline, rod and reel, and spearfishing gear (excluding powerheads), and prohibited the use of black sea bass pots and bottom longlines on SMZs off South Carolina. This prohibition was the result of evidence that use of efficient fishing gear, such as black sea bass pots, does not allow for equitable utilization of the reefs by a larger number of fishermen, and results in

a rapid decline in resident finfish populations on the reefs (Snapper Grouper Regulatory Amendment 7, SAFMC 1998). The use of bangsticks (powerheads) by divers to harvest snapper grouper species is prohibited on the SMZs off South Carolina, a regulation that went into place after the Snapper Grouper Monitoring Team Report 5 evaluation concluded that some of the designated SMZ sites had received considerable fishing pressure from commercial fishing activities utilizing bang sticks and fish traps. The report included findings provided by SCDNR Marine Resources Division staff that the practice of bangsticking on the state's offshore artificial reefs had created a condition of overfishing on a localized basis. Specifically, SCDNR Marine Division staff found evidence during routine examinations of several offshore reef sites of spent shell casings, in some instances up to 50 casings in an area, and a visible lack of greater amberjack at a time when the long-term seasonal residents had been largely present on the offshore reefs (Snapper Grouper Monitoring Team Report 5, 1992). Currently, there are no restrictions on the use of conventional spearguns or hand spears, which are considered additional types of efficient fishing gear. Regulations allow permitted commercial snapper grouper fishermen to use spearguns or hand spears to harvest commercially allowable quantities of these species within the SMZs.

Recreational constituents have voiced concerns over the presence of commercial snapper grouper and coastal migratory pelagic fishing vessels operating on SMZs. Specifically, these recreational constituents feel the use of conventional spearguns by commercial fishermen to harvest fish on these sites may be harmful to the reef fish populations on SMZs. In an August 2009 letter to the South Atlantic Council (**Appendix H**), the SCDNR expressed concern over reports of commercially viable quantities of snapper grouper species being removed from the SMZs, a practice not keeping with the intended purpose for which the sites were established. SCDNR requested that the South Atlantic Council consider restricting all recreational, for-hire, and commercial users of SMZs off of South Carolina to the recreational bag limit (**Appendix H**).

An objective of designating an artificial reef an SMZ as described in Management Measure #17 of the Snapper Grouper FMP: "Upon request to the South Atlantic Council from the permittee (possessor of a Corps of Engineers permit) for any artificial reef or fish attraction device (or other modification of habitat for the purpose of fishing) the modified area and an appropriate surrounding area may be designated as a Special Management Zone (SMZ) that prohibits or restrains the use of specific types of fishing gear that are not compatible with the intent of the permittee for the artificial reef or fish attraction device," (Snapper Grouper FMP, SAFMC 1983). In an August 2009 letter to South Atlantic Council Chairman D. Harris, SCDNR states that harvest of commercially viable quantities of species on SMZs off of South Carolina is not a sustainable practice for these relatively small areas originally designated to improve recreational fishing opportunities and to protect the reef communities from overly-efficient fishing practices, SCDNR's primary objectives in their construction (**Appendix H**). Designating an artificial reef as an SMZ preserves the fishing opportunities artificial reefs provide and serves as an incentive to establish them. Fishing gear that offers "exceptional advantages" over other gear types may significantly reduce the improved fishing opportunities, and eliminate the incentive for developing an artificial reef, which would prevent improved fishing opportunities that would not otherwise exist (Snapper

Grouper FMP, SAFMC 1983). Furthermore, the initial designation of the SMZs was to promote orderly use of the fishery resources on and around the artificial reefs, to reduce potential user group conflicts, and to maintain the intended socioeconomic benefits of the artificial reefs to the maximum extent practicable (Snapper Grouper Regulatory Amendment 1, SAFMC 1987).

The following 29 SMZs (artificial reefs and surrounding areas) have been established in the EEZ offshore South Carolina (**Tables 4-4 and 4-5; Figures 4-2 and 4-3**).

Table 4-4. Special Management Zone (South Carolina) Northeast and Southwest coordinates.

	Latitude	**Longitude**
Paradise Reef	Northern boundary 33°31.59' N. Southern boundary 33°30.51' N.	Eastern boundary 78°57.55' W. Western boundary 78°58.85' W.
Ten Mile Reef	Northern boundary 33°26.65' N. Southern boundary 33°24.80' N.	Eastern boundary 78°51.08' W. Western boundary 78°52.97' W.
Pawleys Island Reef	Northern boundary 33°26.58' N. Southern boundary 33°25.76' N.	Eastern boundary 79°00.29' W. Western boundary 79°01.24' W.
Georgetown Reef	Northern boundary 33°14.90' N. Southern boundary 33°13.85' N.	Eastern boundary 78°59.45' W. Western boundary 79°00.65' W.
Capers Reef	Northern boundary 32°45.45' N. Southern boundary 32°43.91' N.	Eastern boundary 79°33.81' W. Western boundary 79°35.10' W.
Kiawah Reef	Northern boundary 32°29.78' N. Southern boundary 32°28.25' N.	Eastern boundary 79°59.00' W. Western boundary 80°00.95' W.
Edisto Offshore Reef	Northern boundary 32°15.30' N. Southern boundary 32°13.90' N.	Eastern boundary 79°50.25' W. Western boundary 79°51.45' W.
Hunting Island Reef	Northern boundary 32°13.72' N. Southern boundary 32°12.30' N.	Eastern boundary 80°19.23' W. Western boundary 80°21.00' W.
Fripp Island Reef	Northern boundary 32°15.92' N. Southern boundary 32°14.75' N.	Eastern boundary 80°21.62' W. Western boundary 80°22.90' W.
Besty Ross Reef	Northern boundary 32°03.60' N. Southern boundary 32°02.88' N.	Eastern boundary 80°24.57' W. Western boundary 80°25.50' W.
Hilton Head Reef (Artificial Reef - T)	Northern boundary 32°00.71' N. Southern boundary 31°59.42' N.	Eastern boundary 80°35.23' W. Western boundary 80°36.37' W.
Little River Offshore Reef	Northern boundary 33°42.10' N. Southern boundary 33°41.10' N.	Eastern boundary 78°26.40' W. Western boundary 78°27.10' W.
BP-25 Reef	Northern boundary 33°21.70' N. Southern boundary 33°20.70' N.	Eastern boundary 78°24.80' W. Western boundary 78°25.60' W.
Vermilion Reef	Northern boundary 32°57.80' N. Southern boundary 32°57.30' N.	Eastern boundary 78°39.30' W. Western boundary 78°40.10' W.
Cape Romaine Reef	Northern boundary 33°00.00' N. Southern boundary 32°59.50' N.	Eastern boundary 79°02.01' W. Western boundary 79°02.62' W.
Y-73 Reef	Northern boundary 32°33.20' N. Southern boundary 32°32.70' N.	Eastern boundary 79°19.10' W. Western boundary 79°19.70' W.

Eagles Nest Reef	Northern boundary 32°01.48' N. Southern boundary 32°00.98' N.	Eastern boundary 80°30.00' W. Western boundary 80°30.65' W.
Bill Perry Jr. Reef	Northern boundary 33°26.20' N. Southern boundary 33°25.20' N.	Eastern boundary 78°32.70' W. Western boundary 78°33.80' W.
Comanche Reef	Northern boundary 32°27.40' N. Southern boundary 32°26.90' N.	Eastern boundary 79°18.80' W. Western boundary 79°19.60' W.
Murrells Inlet 60 Foot Reef	Northern boundary 33°17.50' N. Southern boundary 33°16.50' N.	Eastern boundary 78°44.67' W. Western boundary 78°45.98' W.
Georgetown 95 Foot Reef	Northern boundary 33°11.75' N. Southern boundary 33°10.75' N.	Eastern boundary 78°24.10' W. Western boundary 78°25.63' W.
New Georgetown 60 Foot Reef	Northern boundary 33°09.25' N. Southern boundary 33°07.75' N.	Eastern boundary 78°49.95' W. Western boundary 78°51.45' W.
North Inlet 45 Foot Reef	Northern boundary 33°21.03' N. Southern boundary 33°20.03' N.	Eastern boundary 79°00.31' W. Western boundary 79°01.51' W.
CJ Davidson Reef	Northern boundary 33°06.48' N. Southern boundary 33°05.48' N.	Eastern boundary 79°00.27' W. Western boundary 79°01.39' W.
Greenville Reef	Northern boundary 32°57.25' N. Southern boundary 32°56.25' N.	Eastern boundary 78°54.25' W. Western boundary 78°55.25' W.
Charleston 60 Foot Reef	Northern boundary 32°33.60' N. Southern boundary 32°32.60' N.	Eastern boundary 79°39.70' W. Western boundary 79°40.90' W.
Edisto 60 Foot Reef	Northern boundary 32°21.75' N. Southern boundary 32°20.75' N.	Eastern boundary 80°04.10' W. Western boundary 80°05.70' W.
Edisto 40 Foot Reef	Northern boundary 32°25.78' N. Southern boundary 32°24.78' N.	Eastern boundary 80°11.24' W. Western boundary 80°12.32' W.
Beaufort 45 Foot Reef	Northern boundary 32°07.65' N. Southern boundary 32°06.65' N.	Eastern boundary 80°28.80' W. Western boundary 80°29.80' W.

Table 4-5. Area of Special Management Zones off South Carolina.

SC SMZ	Area (Square Miles)	% of EEZ off SC
Little River Offshore Reef	0.77	0.003%
Paradise Reef	1.55	0.006%
Ten Mile Reef	3.87	0.014%
Pawleys Island Reef	0.86	0.003%
Bill Perry Jr. Reef	1.22	0.005%
BP-25 Reef	0.89	0.003%
North Inlet 45 Foot Reef	1.33	0.005%
Murrel's Inlet 60 Foot Reef	1.45	0.005%
Georgetown Reef	1.40	0.005%
Georgetown 95 Foot Reef	1.70	0.006%
New Georgetown 60 Foot Reef	2.50	0.009%
CJ Davidson Reef	1.24	0.005%
Cape Romaine Reef	0.34	0.001%
Vermilion Reef	0.44	0.002%
Greenville Reef	1.11	0.004%
Capers Reef	2.21	0.008%
Charleston 60 Foot Reef	1.34	0.005%
Y-73 Reef	0.34	0.001%
Kiawah Reef	3.34	0.012%
Comanche Reef	0.45	0.002%
Edisto 40 Foot Reef	1.21	0.005%
Edisto 60 Foot Reef	1.79	0.007%
Fripp Island Reef	1.68	0.006%
Edisto Offshore Reef	1.88	0.007%
Hunting Island Reef	2.82	0.011%
Beaufort 45 Foot Reef	1.12	0.004%
Betsy Ross Reef	0.75	0.003%
Eagles Nest Reef	0.37	0.001%
Hilton Head Reef/Artificial Reef-T	1.65	0.006%
Total Area	**41.61**	**0.155%**

Restrictions in SMZs off South Carolina include the following:

- The use of a powerhead to take South Atlantic snapper grouper is prohibited. Possession of a powerhead and a mutilated South Atlantic snapper grouper in, or after having fished in, one of these SMZs constitutes prima facie evidence that such fish was taken with a powerhead in the SMZ.
- Fishing may only be conducted with handline, rod and reel, and spearfishing gear.
- Use of a sea bass pot or bottom longline is prohibited.

The major species targeted in the SMZs include Atlantic spadefish, black sea bass, flounder, king mackerel, sharks, and Spanish mackerel. However, little information exists on commercial fishing in the South Carolina SMZs and therefore, the biological impacts of **Preferred Alternative 2** and **Preferred Alternative 3** cannot be quantified at this time.

Any commercial effort is expected to be small. It is expected that modifying management of the SMZs to restrict commercial fishing effort to the bag limit could possibly reduce the amount of harvest in the area and have a positive biological impact on the species regularly targeted.

Alternative 4 would prohibit the use of spearfishing gear within the SMZs, which may provide a slight positive impact to the resource. Spearfishing allows fishermen to more effectively select for larger individuals within target species populations (Sadovy 1994; Meyer 2007; Lloret et al. 2008). Spearfishing is considered to be an efficient harvesting activity that can significantly alter abundance and size structure of target species toward fewer and smaller fish by selective removal of larger individual fish. The removal of larger individual fish of the target species leaves behind smaller individuals to spawn. Over time this can decrease the size and age at sexual maturity and decrease the average size of the population (Sluka and Sullivan 1998; Chapman and Kramer 1999; Matos-Caraballo et al. 2006; Lloret et al. 2008).

Meyer (2007) reported spearfishing can remove a greater biomass of reef fishes than rod and reel fishing. Frisch et al. (2008) found that free-diving (diving without SCUBA) spear fishermen removed larger fish than rod and reel fishermen. Spearfishing can also impact ecosystem health by altering the composition of the overall natural communities of species (Lloret et al. 2008). Reduction in the larger predatory fishes can have a "top-down" effect on fish assemblages by allowing other fish populations to increase, altering the composition of the overall natural community of species, including invertebrates (Lloret et al. 2008). The largest fish are important as predators in maintaining a balanced and complete ecosystem; their selective removal may cause ecological imbalance (McClanahan and Muthiga 1988; Dulvy et al. 2002).

Spearfishing has been found to alter fish behavior (Schroeder and Parrish 2005) and may cause fish to move to different habitats (Jouvenel and Pollard 2001). These habitats may be less favorable for growth and reproduction. Frisch et al. (2008) and Harper et al. (2000) indicate a small percentage of fish speared are discarded. Frisch et al. (2008) also found that some percentage of fish also escape with spear-induced injuries. There is also little marine debris associated with spearfishing activities compared to rod and reel fishing.

4.4.2 Economic Effects

As discussed in **Section 3.6.1.2**, Rhodes and Pan (2007) provide results of a survey of private boat anglers and charter divers fishing on artificial reefs (see **Appendix I**). As stated in Chapter 3, the estimated total (aggregate) trip expenditures by private boat anglers and charter divers making trips to artificial reef sites, including SMZs off South Carolina, were $28.7 million and $0.6 million, respectively, during 2006. These artificial reef users in 2006 represented an economic impact (i.e., economic importance) of approximately $83 million in total sales (output) that generated approximately 1,000 jobs. The South Carolina marine artificial reef system, as developed and managed by the SCDNR, is a significant component of the entire South Carolina coastal economy. In addition, the man-made structures within South Carolina permitted artificial reef areas, as recreational outdoor "destinations," are an

important component of the economic impacts generated by a special group or subset of tourists, (i.e., anglers and scuba divers). One of the goals of implementing the SMZ structures was to maintain intended socioeconomic benefits of the SMZs to recreational anglers.

Commercial landings of species caught on these artificial reefs cannot be quantified due to the way that logbook landings are recorded. The level of detail of reporting where fish are caught is insufficient to allow for harvest on the SMZs to be broken out from harvest made in the fishing zones the SMZs lie in; data are reported in 60 nautical miles square areas. Therefore, the loss associated with a ban on harvest above the recreational bag limit by commercial fishermen cannot be quantified with available data. Both **Preferred Alternative 2** and **Preferred Alternative 3** would be expected to result in small reductions in ex-vessel revenues to commercial fishermen, though some mitigation of these reductions could occur as a result of fishing in other areas. At the same time, **Preferred Alternative 2** and **Preferred Alternative 3** would be expected to result in increased economic benefits to recreational fishermen as a result of allocation of the harvest that would otherwise be taken by commercial fishermen to recreational fishermen. Additional economic benefits would be expected to result from healthier and more sustainable populations at these sites over the long term.

As stated above, based on data collected from charter divers, a total of 3,571 divers participated in charted SC offshore dive trips during 2006 with 53% of these charter divers (1,902 divers) making one or more dives on structures within South Carolina permitted artificial reef sites. The effect of **Alternative 4** on the recreational fishery of South Carolina is expected to be significant. However, the expected adverse economic effects cannot be quantified with available data. Also, if **Alternative 4** is implemented, recreational divers may decide to use other gear in the SMZs or fish outside the SMZs. Therefore, any estimate of losses due to **Alternative 4** would likely be an overestimate of actual losses.

4.4.3 Social Effects

Artificial reefs create unique fishing destinations. Because of this, congestion and user conflicts between recreational users and commercial fishermen may increase under **Alternative 1 (No Action)**. Additionally, because commercial harvest is a relatively recent activity in the SMZs, long-term recreational anglers will bear more of the social costs of additional congestion. However, **Alternative 1 (No Action)** allows for continued commercial harvest and opportunities to expand the commercial fishery to create jobs and provide local seafood.

Preferred Alternative 2 and **Preferred Alternative 3** would "level the playing field" for recreational and commercial fishermen. This may result in a decline or cessation of all commercial harvest within the SMZs because other areas with fewer restrictions may be better options for commercial fishermen. However, commercial harvesters would no longer be able to fully utilize the unique opportunities of these artificial reef habitats. Reduced commercial fishing in the SMZs could lead to reduced congestion issues, less competition between recreational and commercial fishermen, and decreased user conflict.

Additionally, **Preferred Alternative 2** and **Preferred Alternative 3** are more aligned with the overall purposes and goals for the SMZs. Funding to support construction and maintenance for South Carolina's artificial reefs derives mostly from state and federal sources associated with recreational fishing, and also private recreational donations. A percentage of sales of South Carolina's recreational fishing licenses funds the Marine Artificial Reef Program to support construction and maintenance of the state's artificial reefs. The Federal Aid in Sportfish Restoration Program administered by the U.S. Fish and Wildlife Service provides funding to support artificial reefs in South Carolina and can only be used for projects and programs that impact or enhance recreational fishing. Recreational fishing clubs and other entities tied to recreational fishing interests also contribute to South Carolina's Marine Artificial Reef Program through private donations. Since the artificial reef program's inception in 1973, over $7.7 million has been contributed from these 3 primary funding sources (Mel Bell, SCDNR Office of Fisheries Management, personal communication).

Alternative 4 could negatively impact the recreational dive experience, and cause a decline in charter dive trips. Without a suitable alternative gear that provides the same level of satisfaction, prohibition of hand spears and spear guns would cause decreased opportunities for recreational spearfishers. The impact on recreational anglers using other gear types would be positive due to the possibility of more fish available if these highly effective gear types were no longer allowed.

4.4.4 Administrative Effects

Under the **No Action Alternative**, the administrative impacts will not increase. Administrative impacts associated with **Alternatives 2-4** are expected to increase. Administrative impacts may take the form of preparation of regulations, education and outreach materials and law enforcement.

Figure 4-2. Special Management Zones off South Carolina, North geographic area.

Figure 4-3. Special Management Zones off South Carolina, South geographic area.

4.4.5 Conclusion

The Law Enforcement Advisory Panel reviewed CE-BA 2 during their August 2009 and March 2011 meetings, but had no specific recommendations for this action.

The South Carolina Department of Natural Resources (SCDNR) sent a letter to the South Atlantic Council in August 2009 expressing concern over reports of commercial snapper grouper vessels operating on offshore artificial reefs removing commercially viable quantities of species using conventional spear guns. The SCDNR requested the South Atlantic Council consider restricting harvest and possession within South Carolina SMZs to the recreational bag limit for all users.

Because of the limited data on the amount of commercial harvest occurring in SMZs off South Carolina, the South Atlantic Council advised that the intent of designating an artificial reef as an SMZ be captured in the action's discussion. The Snapper Grouper FMP states in Management Measure #17: "Upon request to the South Atlantic Council from the permittee, the artificial reef and surrounding area may be designated an SMZ that prohibits or restrains the use of specific types of fishing gear not compatible with the intent of the permittee (Snapper Grouper FMP, SAFMC 1983)." The SCDNR promotes artificial reefs as recreational fishing areas and the program in South Carolina is funded primarily by the recreational community. The South Atlantic Council selected **Preferred Alternatives 2 and 3** during their December 2010 meeting in order to address the concerns that South Carolina delegates brought forward (**Appendix H**) regarding commercial exploitation of these areas.

The South Atlantic Council concluded **Preferred Alternatives 2 and 3** best address the objective to minimize conflicts and prevent localized overfishing as specified in the Snapper Grouper FMP (Management Measure #17). There is no intent, by this action, to alter any existing prohibition in SMZs other than to include this modification to limit all users to the recreational bag limit in SMZs off South Carolina.

4.5 Action 5. Modify Sea Turtle Release Gear Requirements for the Snapper Grouper Fishery

Alternative 1. No Action. Maintain current sea turtle and smalltooth sawfish release gear requirements for the snapper grouper fishery in federal waters of the South Atlantic. Currently, required gear (regardless of freeboard height) includes:

- a long-handled line clipper or cutter,
- a long-handled dehooker for ingested hooks,
- a long-handled dehooker for external hooks,
- a long-handled device to pull an "inverted V",
- a dipnet,
- a tire (or other comparable cushioned, elevated surface that immobilizes boated sea turtles),
- a short-handled dehooker for ingested hooks,
- a short-handled dehooker for external hooks,
- long-nose or needle-nose pliers,

- bolt cutters,
- monofilament line cutters, and
- at least two types of mouth openers/mouth gags

This equipment must meet the specifications described in 50 CFR 635.21(c)(5)(i)(A-L) with the following modification: any other comparable, cushioned, elevated surface that allows boated sea turtles to be immobilized, may be used as an alternative to the requirement in 50 CFR 635.21(c)(5)(i)(F) to have a tire on board.

Alternative 2. Require all federally-permitted hook and line vessels with no longline gear onboard to have and use a tool capable of cutting the fishing line and a tool capable of removing a hook from a sea turtle or smalltooth sawfish. Require fishermen to follow the sea turtle handling and release guidelines.

Alternative 3. Require all sea turtle and smalltooth sawfish release gear listed under **Alternative 1 (No Action)** for federally- permitted snapper grouper vessels using longline gear, and require [insert specific sea turtle release gear] for federally-permitted vessels fishing with hook-and-line gear.

Preferred Alternative 4. Modify sea turtle and smalltooth sawfish release gear based on freeboard height. Fishermen would still be required to comply with all current sea turtle and smalltooth sawfish release guidelines. The design specifications of required gear and the handling and release techniques employed must comply with those described in the NOAA Fisheries Service document entitled "Careful Release Protocols for Sea Turtle Release with Minimal Injury." NOTE: **Preferred Alternative 4** is recommended by the Southeast Region's Office of Protected Resources Division as the minimum requirement necessary to remain in compliance with the biological opinion.

Preferred Sub-Alternative 4a. Vessels with freeboard height of 4 feet or less would be required to carry and use:

- a short-handled dehooker for ingested hooks; or a dehooker for ingested and a dehooker for external hooks,
- long-nose or needle-nose pliers,
- bolt-cutters,
- mono-filament line cutters,
- cushion/support device (i.e., boat cushion)
- a dipnet,
- at least two types of mouth openers/mouth gags

Preferred Sub-Alternative 4b. Vessels with freeboard height greater than 4 feet (and/or using longline gear) would be required to carry and use:

- a long-handled line cutter,
- a long-handled dehooker for ingested hooks; or a dehooker for ingested and a dehooker for external hooks,
- a long-handled device to pull an "inverted V",
- a dipnet,

- cushion/support device (i.e., boat cushion),
- a short-handled dehooker for ingested hooks; or a dehooker for ingested and a dehooker for external hooks,
- long-nose or needle-nose pliers,
- bolt cutters,
- monofilament line cutters, and
- at least two types of mouth openers/mouth gags

Alternative 5. Modify the design specifications of the current sea turtle and smalltooth sawfish release gear equipment for all federally-permitted, non-longline, snapper grouper vessels with hook-and-line gear on board to match the specifications described in the NOAA Fisheries Service document entitled "Careful Release Protocols for Sea Turtle Release with Minimal Injury." (see **Appendix K**)

South Atlantic Council may select one or more sub-alternatives. Choosing additional sub-alternatives would be especially beneficial for species conservation, but not required to remain in compliance with the biological opinion.

Sub-Alternative 5a. Require all federally- permitted non-longline snapper grouper vessels with hook-and-line gear on board (see **Appendix K**) for specification on each gear type):

- a short-handled dehooker for ingested hooks, or a short-handled dehooker for external hooks,
- cushion/support device (i.e., standard automobile tire or boat cushion)
- long-nose or needle-nose pliers,
- bolt-cutters,
- mono-filament line cutters,
- a dipnet,
- at least two types of mouth openers/mouth gags

Sub-Alternative 5b. Also require:

- a long-handled dehooker for ingested hooks, or a long-handled dehooker for external hooks,

Sub-Alternative 5c. Also require:

- a long-handled line clipper or cutter,

Sub-Alternative 5d. Also require:

- a long-handled device to pull an "inverted V"

4.5.1 Biological Effects

The current sea turtle and smalltooth sawfish release gear requirements in Snapper Grouper Amendment 15B were developed to satisfy requirements of the Endangered Species Act (ESA) biological opinion on the snapper grouper fishery. The biological opinion directed the South Atlantic Council to implement sea turtle and smalltooth sawfish release gear requirements, and required the implementation of safe handling protocols for sea turtles and smalltooth sawfish, among other things. The biological opinion required that the South Atlantic Council consider the sea turtle and smalltooth sawfish release gear requirements in place for the Highly Migratory Species (HMS) fisheries, and at a minimum, implement sea

turtle and smalltooth sawfish release gear requirements similar to those for the Gulf of Mexico reef fish fishery (NMFS 2006). The Gulf of Mexico reef fish fishery requires the same dehooking and disentanglement gear currently used in the HMS longline fisheries for vessels with freeboard heights greater than 4 feet. Vessels with freeboard heights of 4 feet or less are also required the carry HMS dehooking and disentanglement gears, with the exception that only short-handled equipment is mandatory. In Snapper Grouper 15B, the South Atlantic Council ultimately chose to require the same sea turtle and smalltooth sawfish release gears required in the HMS fisheries, making no distinction for vessel freeboard height.

The HMS pelagic longline fishery was the first fishery to require sea turtle and smalltooth sawfish release gear in the Atlantic, and the release equipment developed was originally designed to handle the heavier tackle used in this fishery. As snapper grouper fishermen began using the dehooking and disentanglement gear required in Snapper Grouper Amendment 15B, the effectiveness and necessity of using these "heavy-duty" tools with lighter snapper grouper tackle was called into question. Therefore, the South Atlantic Council has been asked to consider developing an action that would re-address and possibly modify sea turtle and smalltooth sawfish release gear requirements for the snapper grouper fishery.

Alternative 1 (No Action) would maintain the current sea turtle and smalltooth sawfish release gear requirements for the snapper grouper fishery. Regardless of freeboard height, all vessels with hook-and-line (non longline and longline) gear on board would continue to be required to carry the gear listed under **Alternative 1 (No Action)**. The current sea turtle and smalltooth sawfish release gear requirements were established through Snapper Grouper Amendment 15B (SAFMC 2009) and require all vessels having a South Atlantic Unlimited Snapper grouper Permit, a South Atlantic 225 lb Trip Limit Snapper grouper Permit, or a South Atlantic Charter/Headboat Permit for Snapper grouper, and carrying hook-and-line gear onboard to: (1) post the *Sea Turtle Handling/Release Guidelines* placard inside the wheelhouse, or in any easily viewable area, if there is no wheelhouse; (2) have a copy of the "Careful Release Protocols for Sea Turtle Release with Minimal Injury" (Protocols) posted inside the wheelhouse, or within a waterproof case in a readily accessible area, and; (3) possess and use sea turtle handling and release gear consistent with the Protocols. The dehookers, line cutters, and bolt cutters specified under current regulations were designed for and are required in the HMS longline fisheries. Utilizing specialized dehooking and disentanglement gear has been shown to reduce hooking mortality in sea turtles; however, there is some concern that using sea turtle dehooking equipment not designed for the lighter tackle typically used by snapper grouper fishermen could in fact harm sea turtles or smalltooth sawfish during the dehooking process. However, if the heavier-duty dehooking gear required under **Alternative 1** (**No Action**) is causing harm, or is less effective than gear designed for lighter tackle, the benefits of using the current gear may not be as great as could be achieved under other alternatives.

Alternatives 2 and **3** modify the sea turtle and smalltooth sawfish release gear specifications for vessels carrying non-longline hook-and-line gear. Under these alternatives, all vessels with longline gear on board would be required to continue carrying all the dehooking and

disentanglement gear outlined in **Alternative 1**. Under **Alternative 2,** non-longline vessels would be required to carry a tool for cutting the fishing line and a tool for removing an external hook from a sea turtle. **Alternative 2** is similar to sea turtle take mitigation measures currently in place in the Western Pacific (**Appendix L**). Examples of these tools may be a knife and a pair of pliers. Under **Alternative 2**, the fishermen would be required to follow safe sea turtle handling and release guidelines for sea turtles incidentally hooked. The potential biological effects are difficult to predict under **Alternative 2**. Research indicates that the amount of gear remaining on an animal at the time of release plays a large role in determining whether the animal survives the encounter. If lines are cut and no additional effort is made to remove any remaining line or imbedded hooks, the likelihood of post-release mortality increases. The dehooking and disentanglement gear currently required in the fishery has been specifically designed to effectively remove most, if not all, hook-and-line gear. Each piece of required gear is meant to address a number of potential dehooking/disentanglement scenarios (i.e., hooked and entangled, only entangled, only hooked, etc.). If, as proposed under **Alternative 2**, less release equipment is required, it is possible that even fishermen following the safe handling and release guidelines would encounter a hooking/entanglement scenario they could not effectively address with this truncated suite of gear. Such a scenario would likely result in a reduced biological benefit to sea turtles. However, if the sea turtle release guidelines are followed, and hooks or entangling line are safely removed, there would likely be a biological benefit to sea turtles.

Depending upon which tools were selected, and what their design specifications were, the requirement to have tools onboard that are capable of ridding a sea turtle or smalltooth sawfish of fishing gear would be biologically preferable to not requiring any such tools at all, and may in fact result in greater or equal biological benefit relative to **Alternative 1 (No Action)** since possible injury inflicted on a sea turtle or smalltooth sawfish from use of inappropriate release gear could be avoided.

However, because the requirements of the biological opinion outlined what the South Atlantic Council must consider when implementing sea turtle and smalltooth sawfish release gear requirements, **Alternative 2** would not be in compliance with the current biological opinion. Selecting **Alternative 2** may require re-initiation of ESA section 7 consultation.

Alternative 3 differs from **Alternative 2** by identifying specific types of sea turtle and smalltooth sawfish release equipment for snapper grouper vessels carrying non-longline gear. **Alternative 3** also maintains the status quo sea turtle release gear requirements for snapper grouper vessels carrying longline gear onboard. This requirement ensures that vessels with heavier tackle are adequately equipped to release sea turtles that become hooked or entangled in fishing gear. **Alternative 3** may have a slightly greater positive biological impact than **Alternative 2** since the risk of fishermen not having adequate gear onboard to safely release a hooked or entangled sea turtle or smalltooth sawfish would be minimized through the specification of required tools.

Preferred Alternative 4 would require different lengths and types of dehooking tools dependent upon the freeboard height of the vessel, which tracks the sea turtle release gear regulations in the Gulf of Mexico reef fish fishery (see **Appendix J**). **Preferred Alternative**

4 also offers the option (through **sub-alternatives 4a** and **4b**) of tailoring sea turtle and smalltooth sawfish release gear specifications to increase effectiveness when used with lighter tackle in the snapper grouper fishery. The biological benefits of **Preferred Alternative 4** are likely to be very similar to **Alternative 1 (No Action). Preferred Alternative 4** and its sub-alternatives reference the updated release gear design specifications that now include a wider range of gear design parameters. These new parameters should be appropriate for the lighter tackle used in the snapper grouper fishery. The alternative and its sub-alternatives would also change the sea turtle release gear requirements based on the size of the vessels. For the safety of the crew and the animal, all incidentally caught sea turtles are recommended to be brought on board when working to disentangle/dehook them, regardless of a vessel's freeboard height. When an animal is on board, long-handled dehooking gear is likely unnecessary because of the close proximity of the animal. In the event an animal is unable to be brought on board, it is unlikely that disentanglement/dehooking efforts can be effective without long-handled dehooking gear for vessels with freeboard heights of greater than 4 feet, because of the distance between the gunwale and the surface of the water. In contrast, vessels with a freeboard height of 4 feet or less are unlikely to need the long-handled release equipment, because of how close the gunwale is to the surface of the water. For vessels with shorter freeboard height, disentanglement/dehooking efforts can take place at the side of the vessel. In these scenarios, long-handled dehooking gear is likely unnecessary. Since the long-handled dehooking gear is unlikely to play a role in disentanglement/dehooking activities for vessels with shorter freeboard heights, removing the requirement to carry long-handled gear for these vessels (**Preferred sub-Alternative 4a**) is unlikely to have any negative biological effects. Since vessels with freeboard heights of greater than 4 feet would still be required to carry long-handled equipment, **Preferred sub-Alternative 4b** is also unlikely to have negative biological effects.

Alternative 5 would modify the current sea turtle release gear requirements (noted in **Alternative 1**) for all federally-permitted non-longline snapper grouper vessels with hook-and-line gear on board. **Sub-alternative 5a** would require a minimum set of release equipment more appropriate for the smaller tackle used in the snapper grouper hook-and-line fishery. The biological benefit of **sub-alternative 5a** would likely be similar to **Alternative 1**. Since **sub-alternative 5a** requires less release equipment than **Alternative 1**, it is possible a fisher would be unable to safely release a sea turtle or smalltooth sawfish due to a lack of long-handled release equipment. In such a case the biological benefits of **sub-alternative 5a** may be less than **Alternative 1**. However, the changes in design specifications to the required equipment could make them more effective in releasing hooked or disentangled sea turtles or smalltooth sawfish. Under these circumstances the biological benefits from **sub-alternative 5a** may be greater than **Alternative 1.** With each additional sub-alternative selected, the overall biological benefit from the action is likely to increase. Since each piece of equipment has new design criteria, each piece is likely to be more effective at dehooking and disentangling the lighter tackle used in the fishery. Selecting all four sub-alternatives is likely to have the greatest biological benefit of all the proposed alternatives. This would ensure that both short- and long-handled release equipment is on board, and that those gear are designed to handle lighter tackle.

4.5.2 Economic Effects

Under **Alternative 1 (No Action)**, expenses totaled $617-$1,115 (2006 dollars) per vessel as estimated in Snapper Grouper Amendment 15B. Additional expenses were incurred in onboard storage requirements of the gear. When analyzing **Alternatives 2-5**, it was assumed that all vessels participating in the snapper grouper fishery already carry the release gear under **Alternative 1 (No Action)**.

As suggested above, biological gains may be realized with the use of release gear more appropriate to the vessel. **Alternatives 2** and **3** attempt to better match gear with the vessel and are likely to yield greater biological and economic benefits than **Alternative 1**. Under **Alternative 2**, no specific gear is listed. While **Alternative 2** and the other alternatives may result in increased economic benefits resulting from increased long-term biological benefits compared to **Alternative 1 (No Action)** because more appropriate release gear is being used, effectiveness is difficult to estimate and enforcement may be difficult since success relies heavily on how well sea turtle release guidelines are adhered to.

Alternative 3 differs slightly from **Alternative 2** in that specific gear is identified for vessels using light tackle. Therefore, no enforcement issues should arise and all vessels would be carrying appropriate gear. For this reason, **Alternative 3** is expected to yield slightly higher long-term economic benefits than **Alternatives 1** and **2**. Appropriate cutting and de-hooking gear is assumed to already be on board all vessels, so no additional gear costs would be expected to be incurred under **Alternatives 2** and **3**.

Out-of-pocket release gear expenses per *new entrant* for **Preferred Alternatives 4a** and **4b** are estimated to range from $324-$490 for vessels with less than 4 feet freeboard and from $564-$987 for vessels with more than 4 feet freeboard. There are no release gear expenses for those already participating in the fishery since all of the gear required under **Preferred Alternatives 4a** and **4b** is already required under **Alternative 1 (No Action)**. However, under **Preferred Alternatives 4a** and **4b**, vessels will be required to carry less gear. This will free up more space onboard the vessels.

Alternative 5 would modify the gear requirements under **Alternative 1**. **Alternatives 5a-5d** would require gear already possessed by fishermen and listed under **Alternative 1**, but smaller sizes of the same required gear. Therefore, no negative economic effects would be expected as a result of the **Alternative 5** sub-alternatives unless fishermen purchased the smaller gears identified in the sub-alternatives.

4.5.3 Social Effects

Making no change to the requirements (**Alternative 1)** requires the same bycatch gear for all vessels, regardless of size. The cost per vessel could represent a prohibitive additional operational cost for new entrants, which may result in decreased opportunities for next-generation fishermen. However, all vessels currently participating would be expected to incur little or no social impacts because it is assumed that active fishermen already carry the release gear under **Alternative 1**.

As discussed in the previous section (4.5.2) **Alternative 2, Alternative 3, Preferred Alternative 4**, and **Alternative 5** allow for variation in release gear requirements depending on vessel size and fishing gear. The more appropriately matched the release gear requirements, the lower the additional costs for smaller operations. This would be expected to result in positive social benefits by minimizing costs for release gear for new entrants.

4.5.4 Administrative Effects

Alternative 1 (No Action) would not result in an increase in administrative impacts. These requirements were implemented in 2008 and fishermen are aware of the requirements. **Alternative 2** and **Alternative 3** would require education and outreach to ensure fishermen understand the proper sea turtle handling techniques. These alternatives are expected to have the highest rate of voluntary compliance due to the ease of the regulations so the enforcement burden is expected to be lower than the other alternatives. **Preferred Alternative 4** and associated **sub-alternatives** would increase the administrative burden related to education, outreach and enforcement because there would be different requirements for vessels with differing freeboard heights. **Alternative 5** and associated **sub-alternatives 5a-5d** would increase the administrative burden in the form of education, outreach and monitoring and enforcement.

4.5.5 Conclusion

The Snapper Grouper Advisory Panel reviewed this action during February 2011, and comments were received in support of modifying gear requirements (for vessels carrying lighter tackle) from the current regulations implemented under Snapper Grouper Amendment 15B. Comments were received from several members that requested the South Atlantic Council look into other options than what is currently effective in the Gulf of Mexico snapper grouper commercial fishery. The comments indicated that the Gulf of Mexico regulations do not adequately address modifying gear requirements for vessels carrying lighter tackle, thus problem gears for the commercial fishery remain.

The Law Enforcement Advisory Panel reviewed CE-BA 2 during their March 2011 meeting and recommended the South Atlantic Council consider modifying gear requirements in the South Atlantic that are compatible with regulations in the Gulf of Mexico for enforcement purposes. They recommended that determination of freeboard height be defined in the regulations upon implementation of new gear requirements for the snapper grouper fishery.

This action was relocated into CE-BA 2 from Snapper Grouper Regulatory Amendment 9 during the September 2010 South Atlantic Council meeting.

In March, 2011, the South Atlantic Council reviewed revised alternatives based upon input from the NOAA Fisheries Service Protected Resources Division and Southeast Fishery Science Center. The South Atlantic Council was advised that a re-initiation of a section 7 consultation under the biological opinion requirement of the ESA would be triggered when an agency action is modified that causes an effect on the listed species not previously

considered. A re-initiated section 7 consultation of the entire snapper grouper fishery may result in additional gear requirements if regulations similar to the Gulf fishery are not considered in the South Atlantic. The South Atlantic Council was advised if they chose a preferred alternative less restrictive than **Alternative 4** or **Alternative 5**, a re-initiation of section 7 will likely occur. Protected Resources Division endorses **Alternative 4** for this action. Thus, the South Atlantic Council selected **Alternative 4** as preferred during the March 2011 meeting in order to modify current gear requirements to address lighter tackle, while remaining in compliance with the current biological opinion requirement. The preferred alternative also best meets the objectives of the Snapper Grouper Fishery Management Plan, as amended, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

4.6 Action 6. Amend the Snapper Grouper FMP to designate new EFH-HAPCs

Alternative 1. No Action. Do not amend the Snapper Grouper FMP to designate new Essential Fish Habitat – Habitat Areas of Particular Concern (EFH-HAPCs).

Preferred Alternative 2. Amend the Snapper Grouper FMP to designate one or more of the following EFH-HAPCs.

Sub-alternative 2a. Designate 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.

Sub-alternative 2b. Designate 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.

Preferred Alternative 3. Designate 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
- East Hump MPA

Figure 4-4. Spatial Presentation of Northern Portion of Tilefish EFH-HAPC.

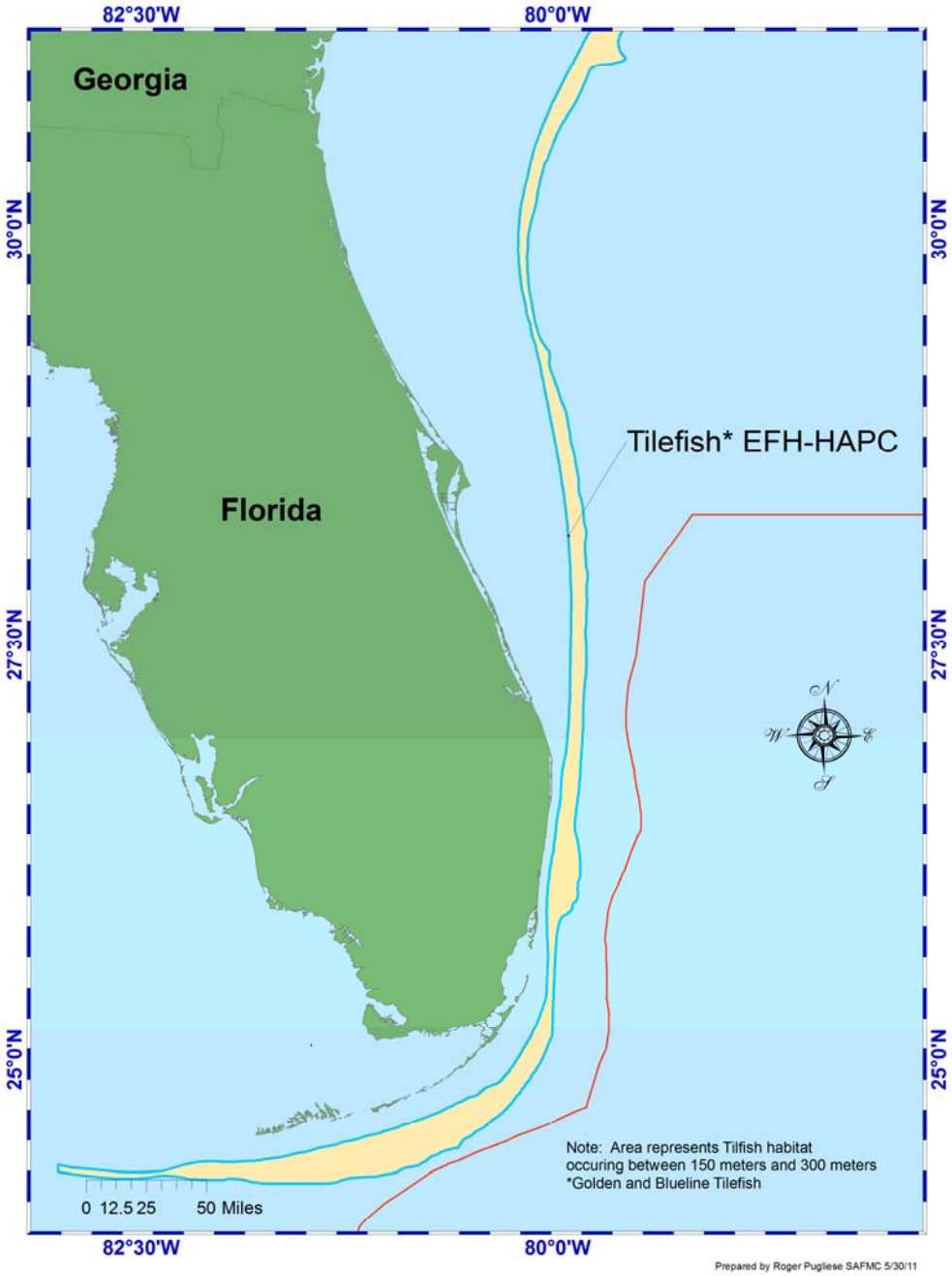


Figure 4-5. Spatial Presentation of Southern Portion of Tilefish EFH-HAPC.

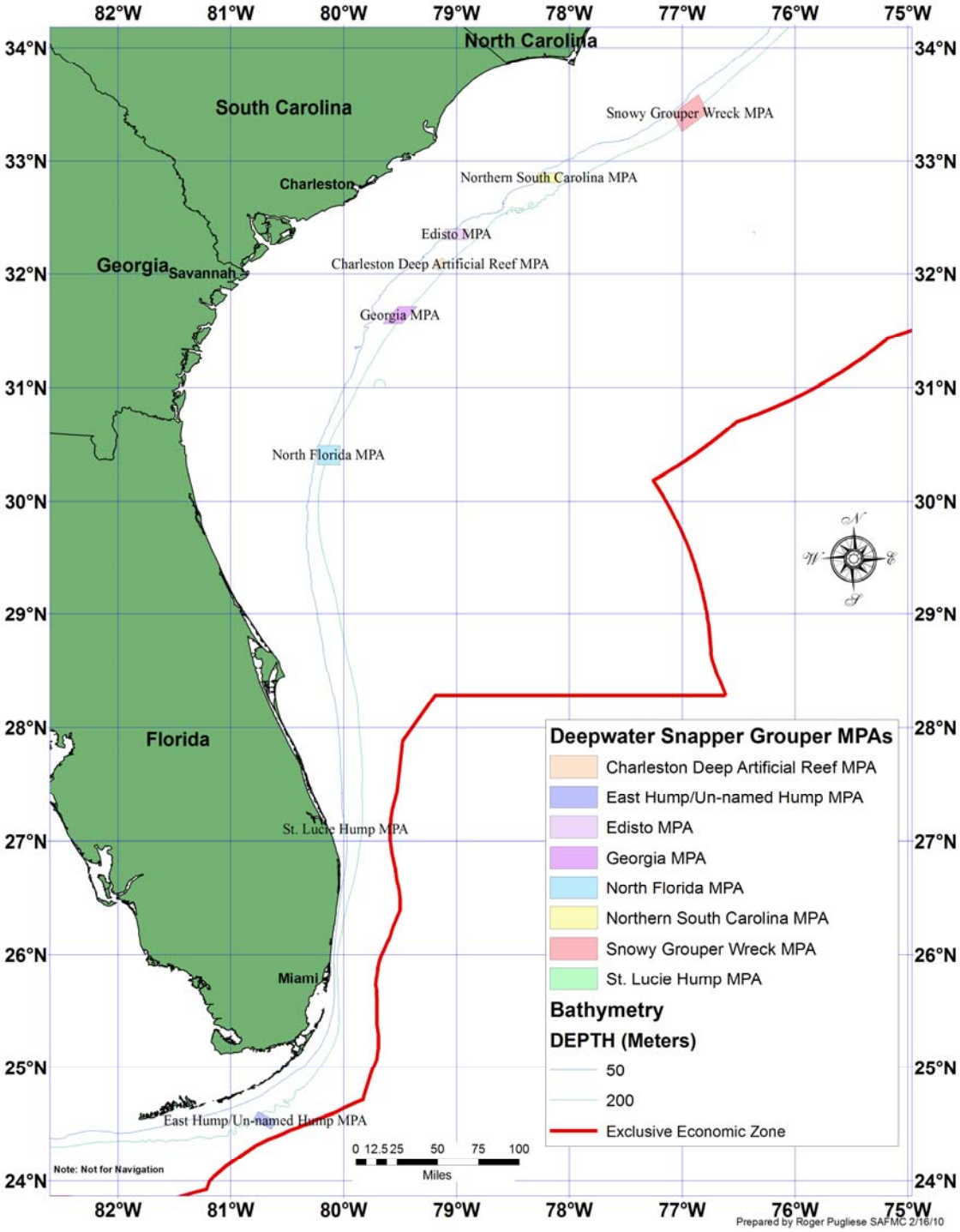


Figure 4-6. Deepwater Snapper Grouper Marine Protected Areas.

4.6.1 Biological Effects

Essential Fish Habitat and EFH-HAPCs were established as Amendment 10 to the Snapper Grouper FMP as part of the Comprehensive EFH Amendment (SAFMC 1998b) and are presented in **Section 3.4.2** and **Table 4-6**.

Alternative 1 (No Action) would not add an area highlighting the importance of golden tilefish and blueline tilefish (**Figure 4-4, 4-5**) or the value of emphasizing the habitat in the deepwater MPAs (**Figure 4-6)** established in Amendment 14 to the Snapper Grouper FMP (SAFMC 2007). **Preferred Alternative 2** addresses an oversight in the initial designation of Snapper Grouper EFH through the Comprehensive EFH Amendment (SAFMC 1998b) where the habitat plan describes in detail tilefish habitat and proposes the general distribution between 100 and 300 meters as an area considered to be EFH-HAPC for tilefish. While considered EFH, the area was not included in the proposed list of EFH-HAPCs. **Alternative 2a** for golden tilefish and **Alternative 2b** for blueline tilefish propose respective detailed descriptions for EFH-HAPCs. The additional specification of the MPAs for deepwater species as EFH-HAPCs (**Preferred Alternative 3**) is intended to protect the entire area as a unique habitat complex and enhance EFH consultations pertaining to non-fishing activities that could potentially impact these protected habitats.

Table 4-6. Summary evaluation of the existing and proposed EFH-HAPC for snapper grouper as it relates to the criteria.

EFH-HAPC and Criteria Evaluation	Ecological Function	Sensitivity to Environmental Degradation	Threat from Development Activities	Rarity of Habitat
The Point, NC	Medium	Low	Medium	High
The Ten Fathom Ledge, NC	High	Low	Low	High
Big Rock, NC	High	Low	Medium	High
Charleston Bump, SC	High	Low	Medium	High
Mangrove habitat	High	High	High	High
Seagrass habitat	High	High	High	High
Oyster/shell habitat	High	Medium	High	High
All coastal inlets	Medium	Low	Medium	Medium
All state-designated nursery habitats	High	High	High	High
Pelagic and benthic *Sargassum*	High	Low	Low	High
Hoyt Hills (wreckfish)	High	Low	Medium	High
Oculina HAPC, FL	High	Medium	Low	High
All hermatypic coral habitats and reefs	High	High	Low	High
Manganese outcroppings of the Blake Plateau	High	Low	Medium	High
Artificial reef SMZs	Medium	Low	Low	High
Golden Tilefish Habitat	High	Low	Medium	High
Blueline Tilefish Habitat	High	Low	Medium	High
Deepwater Marine Protected Areas	High	Low	Medium	Medium

The designation of additional EFH-HAPCs for snapper grouper species would not result in direct impacts to the biological resources of the west-central Atlantic Ocean. Rather, the EFH-HAPC designation under this option would provide a future opportunity for the South Atlantic Council to establish regulations to protect EFH from fishing activities in the EEZ and to review and recommend EFH conservation measures to protect surface waters from non-fishing activities which are undertaken, authorized, or funded by federal agencies.

4.6.2 Economic Effects

Designation of additional EFH-HAPCs would require the South Atlantic Council to consider all operations or actions that might interact with or affect the EFH-HAPC, and may trigger a consultation for any activity that may affect the habitat. The direct effects of additional regulatory consideration would be the financial costs of a protracted regulatory process. Additional effects would accrue to any restrictions imposed as a result of the evaluation of impact of these activities. A consultation may incur costs associated with production delays, project/activity design modification, or mitigation measures. Since any restrictions that may subsequently be placed on these activities are unknown at this time, it is not possible to explicitly describe their effects. However, designation of additional EFH-HAPCs is expected to increase the likelihood that long-term resource goals are met due to increased protection through consultation requirements. A healthy, sustainable resource is presumed to result in increased long-term economic benefits relative to less protection. Assuming the areas are appropriate to the resource, both **Preferred Alternative 2** and **Preferred Alternative 3** would be expected to result in greater protection of the resource than **Alternative 1 (No Action)** and provide for increased long-term economic benefits.

4.6.3 Social Effects

There will be few social impacts from establishing EFH-HAPCs and would most likely come from future actions that are associated with such designations. In some cases, protection of habitat as in **Preferred Alternative 2** and **Alternative 3** could later lead to harvesting restrictions in areas where harvesting presently takes place or other actions which may impose similar constraints on penaeid shrimp fishermen or processors. **Alternative 1** would be less likely to result in negative short-term impacts on harvesters and processors than **Preferred Alternative 2** or **Preferred Alternative 3**, which may decrease ability to harvest shrimp. Overall, better protection (**Preferred Alternative 2** and **Preferred Alternative 3**) of EFH-HAPC is expected to result in increased long-term benefits to society.

4.6.4 Administrative Effects

Designation of new EFH and EFH-HAPC would require consideration of all operations or actions that might interact with or affect the EFH, and may trigger a consultation for any activity that may affect the habitat. The direct effects of additional regulatory consideration would be the financial costs of a protracted regulatory process. Additional effects would accrue to any restrictions imposed as a result of the evaluation of impact of these activities. A consultation may incur costs associated with production delays, project/activity design modification, or mitigation measures. Since any restrictions that may subsequently be placed

on these activities are unknown at this time, it is not possible to explicitly describe their effects.

It is worth noting that identification of EFH will alter the process by which permits for activities which impact EFH and EFH-HAPCs are issued. The potential for increased restrictions, mitigation, and permitting requirements may have impacts upon the behavior of individuals and agencies seeking permits. The nature and extent of those impacts are unknown and will undoubtedly vary depending upon the individual and/or agency.

4.6.5 Conclusion

In reviewing the South Atlantic Council's existing EFH-HAPC designations, South Atlantic Council staff and NOAA Fisheries Service Habitat Conservation staff determined that while the original Habitat Plan highlighted the unique characteristics of tilefish habitat as potential EFH-HAPC, the wording was not included in the final designation for the snapper grouper FMP. In addition, the Ecosystem Committee, at their meeting in June 2010, indicated a desire to designate the deepwater MPAs for snapper grouper species as EFH-HAPCs to enhance protection of the habitat complex contained in the MPAs. In September 2010, NOAA Fisheries Service engaged regional deepwater fishery scientists in the development of definitions of EFH-HAPC for blueline tilefish and golden tilefish.

The Habitat Advisory Panel, in November 2010, recommended inclusion of the tilefish definitions and the Deepwater MPAs in CE-BA 2 as EFH-HAPCs under the Snapper Grouper FMP. The South Atlantic Council approved CE-BA 2 for public hearing in December 2010. Hearings were held in February 2011 and the South Atlantic Council adopted **Alternative 2, sub-Alternatives 2a** and **2b,** and **Alternative 3** as preferred in March 2011. The preferred alternatives also best meet the objectives of the Snapper Grouper Fishery Management Plan, as amended, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

4.7 Action 7. Amend the Coral, Coral Reefs and Live/Hardbottom Habitat Fishery Management Plan (Coral FMP) to designate new Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs)

Alternative 1. No Action. Do not amend the Coral FMP to designate new Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs).

Preferred Alternative 2. Amend the Coral FMP to designate the following Deepwater Coral HAPCs as designated in Comprehensive Ecosystem-Based Amendment 1 as EFH-HAPCs: Cape Lookout Coral HAPC, Cape Fear Coral HAPC, Blake Ridge Diapir Coral HAPC, Stetson-Miami Terrace Coral HAPC, Pourtalés Terrace Coral HAPC.

4.7.1 Biological Effects

EFH and EFH-HAPCs for corals were established through Amendment 4 to the Coral FMP as part of the Comprehensive EFH Amendment (SAFMC 1998b) and are presented in **Section 3.4.1**. **Alternative 1 (No Action)** would not propose additional EFH-HAPCs intended to aid in the conservation of coral and live bottom habitat, especially when addressing policy or permit activities associated with non-fishing activities. In July 2010, a final rule was published establishing deepwater Coral HAPCs in the South Atlantic region. **Preferred Alternative 2** proposes to further emphasize the importance of these protected deepwater ecosystems by designating them as EFH-HAPCs (**Figure 4-7**). While habitats within the boundaries of the coral HAPCs are essential fish habitat for other managed species, designation of the entire area as an EFH-HAPC would in policy and permit review, support consideration of conservation of the contiguous habitats found in this unique deepwater ecosystem. The Deepwater Coral HAPCs designated in CE-BA1 are being proposed as EFH-HAPCs to highlight the value of this unique deepwater ecosystem and facilitate more effective EFH conservation. A brief description of the CHAPCs contained in CE-BA1 follows.

The Cape Lookout *Lophelia* Banks Coral HAPC encompasses two areas. The northernmost area contains the most extensive coral mounds off of North Carolina. The main mound system rises vertically nearly 80 meters (262 feet) over a distance of about one kilometer (0.62 miles). Sides and tops of these mounds are covered with extensive *Lophelia pertusa*. The second area contains mounds that rise at least 53 meters (174 feet) over a distance of about 0.4 kilometers (0.2 miles). They appear to be of the same general construction as the northern Bank, built of coral rubble matrix that had trapped sediments. Extensive fields of coral rubble surround the area. Both living and dead corals are common to this bank, with some living bushes being quite large. Over 54 fish species have been observed along these banks. In addition, these areas support a well-developed invertebrate fauna.

The Cape Fear *Lophelia* Coral HAPC, which occupies 135 square kilometers (52 square miles), encompasses mounds rising nearly 80 meters (262 feet) over a distance of about 0.4 kilometers (0.2 miles) and exhibits some of the most rugged habitat and vertical excursion of any area sampled. The mounds appear to be of the same general construction as those in the Cape Lookout Banks, built of coral rubble matrix with trapped sediments. Extensive fields of coral rubble surround the area and both living and dead corals are common on this bank. Over 12 fish species have been observed, including the greatest numbers of large fishes off North Carolina. Of the 12 species, commercially important species includes red bream and wreckfish. This is the only area off North Carolina where wreckfish have been observed. Of species commonly taken, only blackbelly rosefish were reported.

The Stetson-Miami Terrace Coral HAPC is the largest of the deepwater Coral HAPCs and encompasses areas off the coasts of South Carolina, Georgia, and East Florida to the Miami Terrace off of Biscayne Bay. Below are descriptions of the main areas encompassed by this proposed Coral HAPC.

Stetson Reef is characterized by hundreds of pinnacles along the eastern Blake Plateau offshore South Carolina and over 200 coral mounds. This area supports a 152 meter-tall (500

feet) pinnacle in 822 meters (2,697 feet) of water where recent submersible dives discovered live bushes of *Lophelia* coral, sponges, gorgonians, and black coral bushes. This represents one of the tallest *Lophelia* coral lithoherms known.

The Savannah and East Florida Lithoherms site is characterized by numerous lithoherms at depths of 550 meters (1,804 feet) with relief up to 60 meters (197 feet) that provide live-bottom habitat. Submersible dives found that these lithoherms provided habitat for large populations of massive sponges and gorgonians in addition to smaller macroinvertebrates which have not been studied in detail. Some ridges have nearly 100% cover of sponges. Although few large fish have been observed at this site, a swordfish, several sharks, and numerous blackbelly rosefish were noted. Further south, echosounder transects along a 222-kilometer (138-mile) stretch off northeastern and central Florida (depth 700-800 meters; 2,297-2,625 feet) mapped nearly 300 coral mounds from 8 to 168 meters tall (26-551 feet).

The Miami Terrace and Escarpment is a Miocene-age terrace off southeast Florida that supports high relief hardbottom habitats and rich benthic communities in 200-600 meter (1,969 feet) depths. Dense aggregations of 50 to 100 wreckfish were observed, in addition to blackbelly rosefish, skates, sharks, and dense schools of jacks. *Lophelia* mounds are also present at the base of the escarpment, within the Straits of Florida, but little is known of their abundance, distribution, or associated fauna. The steep escarpments, especially near the top of the ridges, are rich in corals, octocorals, and sponges.

Like the Miami Terrace, the Pourtalés Terrace Coral HAPC is a Miocene-age terrace. It is located off the Florida Reef Tract and includes high relief hardbottom habitats and rich benthic communities. Sinkholes are present on the outer edge of the terrace, including the Jordon sinkhole, which may be one of the deepest known. A total of 26 fish taxa were identified from the sinkhole and bioherm sites. In contrast to the Coral HAPCs, the Pourtalés Terrace is in depths of 200 to 450 meters (656-1,476 feet) and a number of deepwater snapper grouper species have been observed in the area. Observed species include tilefish, sharks, speckled hind, yellowedge grouper, warsaw grouper, snowy grouper, blackbelly rosefish, red porgy, drum, scorpion fish, amberjack and phycid hakes. One of the Type 2 Marine Protected Areas (MPAs) identified in Amendment 14 to the Snapper Grouper FMP, East Hump/Un-named Hump MPA, is located within the Pourtalés Terrace Coral HAPC. The MPA is located approximately 27 kilometers (13 nm) southeast of Long Key, Florida.

A summary evaluation of the existing and proposed EFH-HAPC as it relates to the criteria is in **Table 4-7.**

Table 4-7. Summary evaluation of the EFH-HAPC for coral, coral reefs and live hardbottom habitat as it relates to the criteria.

EFH-HAPC and Criteria Evaluation	Ecological Function	Sensitivity to Environmental Degradation	Threat from Development Activities	Rarity of Habitat
Ten Fathom Ledge, NC	Medium	Low	Medium	Medium
Big Rock, NC	Medium	Low	Medium	Medium
The Point, NC	Medium	Low	Medium	Medium
Hurl Rocks, SC	Medium	High	High	Medium
Charleston Bump, SC	Medium	Low	Medium	Medium
Gray's Reef NMS, GA	High	Low	Low	Medium
Phragmatopoma worm reefs, FL	Medium	High	Medium	High
Oculina Banks from Ft. Pierce to Cape Canaveral, FL	High	Low	Low	High
Nearshore hardbottom off from Cape Canaveral to Broward County, FL	High	Medium	High	Medium
Offshore hardbottom from Palm Beach County to Fowey Rocks, FL	High	Low	Medium	Medium
Biscayne Bay, FL	Medium	Low	Medium	Medium
Biscayne National Park, FL	Medium		Medium	Low
Florida Keys NMS, FL	High	High	High	High
Deepwater Marine Protected Areas	High	Low	Medium	Medium

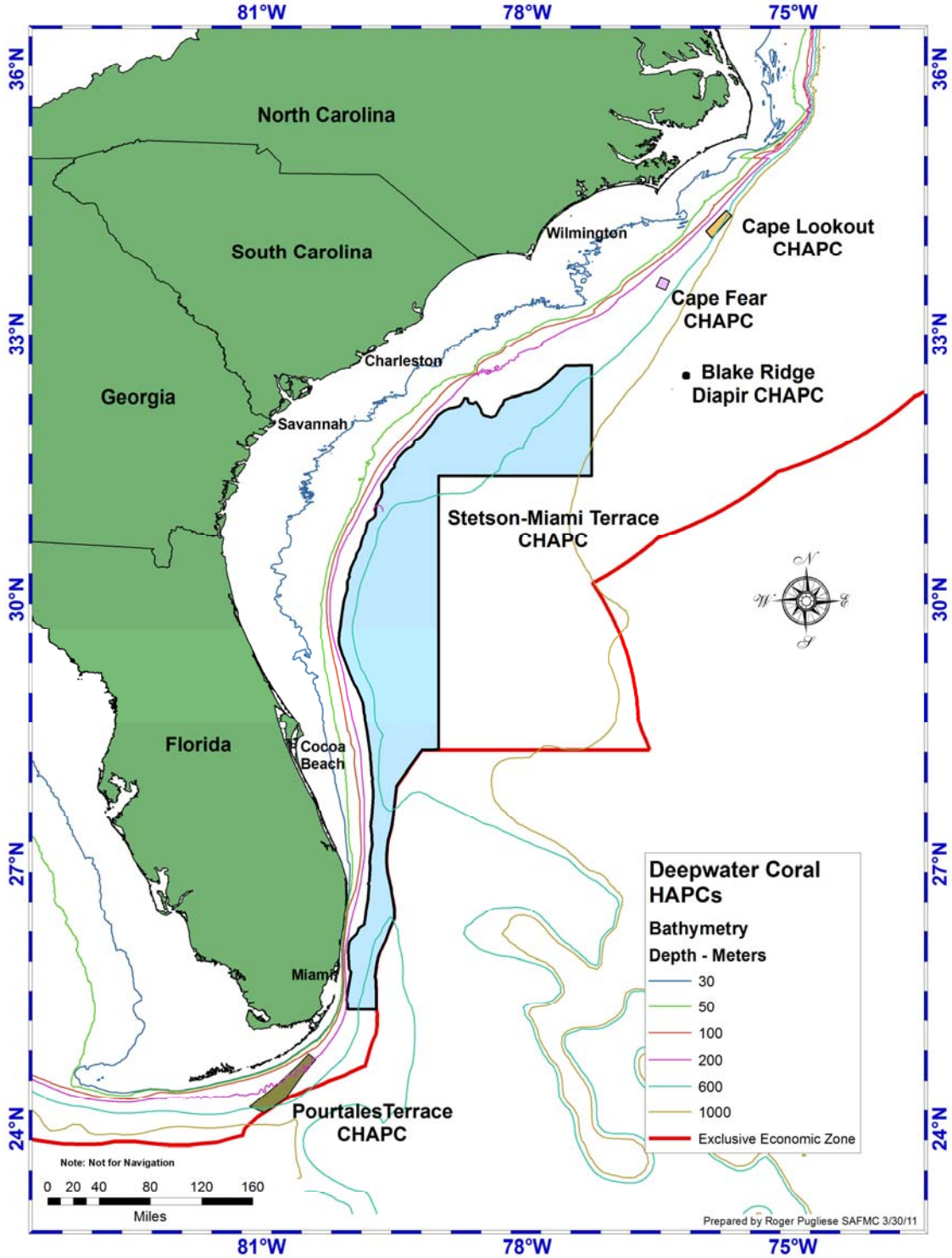


Figure 4-7. Deepwater Coral Habitat Areas of Particular Concern (SAFMC 2009a).

The designation of additional EFH-HAPCs for coral would not result in direct impacts to the biological resources of the west-central Atlantic Ocean. Rather, the EFH-HAPC designation under this option would provide a future opportunity for the South Atlantic Council to establish regulations to protect EFH from fishing activities in the EEZ and to review and recommend EFH conservation measures to protect habitat from non-fishing activities which are undertaken, authorized, or funded by federal agencies.

4.7.2 Economic Effects

Designation of EFH-HAPC would require the South Atlantic Council to consider all operations or actions that might interact with or affect the EFH-HAPC, and may trigger a consultation for any activity that may affect the habitat. The direct effects of additional regulatory consideration would be the financial costs of a protracted regulatory process. Additional effects would accrue to any restrictions imposed as a result of the evaluation of impact of these activities. A consultation may incur costs associated with production delays, project/activity design modification, or mitigation measures. Since any restrictions that may subsequently be placed on these activities are unknown at this time, it is not possible to explicitly describe their effects. However, designation of additional EFH-HAPCs is expected to increase the likelihood that long-term resource goals are met due to increased protection through consultation requirements. A healthy, sustainable resource is presumed to result in increased long-term economic benefits relative to less protection. Assuming the area is appropriate to the resource, **Preferred Alternative 2** would be expected to result in greater protection of the resource than **Alternative 1 (No Action)** and provide for increased long-term economic benefits over **Alternative 1 (No Action)**.

4.7.3 Social Effects

There will be few social impacts from establishing EFH-HAPCs and would most likely come from future actions that are associated with such designations. There will be no short-term negative impacts on fishing activities because bottom-fishing practices were prohibited in CE-BA1. Overall, better protection (**Preferred Alternative 2**) of EFH-HAPC is expected to result in increased long-term social benefits.

4.7.4 Administrative Effects

Designation of new EFH and EFH-HAPC would require consideration of all operations or actions that might interact with or affect the EFH, and may trigger a consultation for any activity that may affect the habitat. The direct effects of additional regulatory consideration would be the financial costs of a protracted regulatory process. Additional effects would accrue to any restrictions imposed as a result of the evaluation of impact of these activities. A consultation may incur costs associated with production delays, project/activity design modification, or mitigation measures. Since any restrictions that may subsequently be placed on these activities are unknown at this time, it is not possible to explicitly describe their effects.

It is worth noting that identification of EFH will alter the process by which permits for activities which impact EFH and EFH-HAPCs are issued. The potential for increased restrictions, mitigation, and permitting requirements may have impacts upon the behavior of individuals and agencies seeking permits. The nature and extent of those impacts are unknown and will undoubtedly vary depending upon the individual and/or agency.

4.7.5 Conclusion

The proposal to designate the deepwater Coral HAPCS as EFH-HAPCs was presented to the Habitat Advisory Panel in November 2010, and they recommended their inclusion into CE-BA 2. CE-BA 2 was approved for public hearing with the proposed EFH-HAPC designation by the South Atlantic Council in December 2010. Hearings were held in February 2011 and the South Atlantic Council adopted **Preferred Alternative 2** in March 2011 to further emphasize the importance of these protected deepwater coral ecosystems.

While habitats within the boundaries of the coral HAPCs are essential fish habitat for other managed species, designation of the entire area as an EFH-HAPC would require enhanced EFH consultation pertaining to non-fishing activities that may negatively impact the deepwater Coral HAPCs. The South Atlantic Council concluded the preferred alternative also best meets the objectives of the Coral Fishery Management Plan, as amended, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

4.8 Action 8. Amend the Fishery Management Plan (FMP) for Pelagic *Sargassum* Habitat to designate EFH

Alternative 1. No Action. Do not amend the *Sargassum* FMP to designate Essential Fish Habitat (EFH). The South Atlantic Council must designate EFH for all managed species including Pelagic *Sargassum* Habitat.

Alternative 2. Amend the *Sargassum* FMP to designate the top 10 meters of the water column in the South Atlantic EEZ as EFH for Pelagic *Sargassum*.

Preferred Alternative 3. Amend the *Sargassum* FMP to designate the top 10 meters of the water column in the South Atlantic EEZ bounded by the Gulfstream, as EFH for pelagic *Sargassum*.

4.8.1 Biological Effects

The identification of essential habitat for pelagic *Sargassum* enables the South Atlantic Council to protect EFH more effectively and take timely actions when necessary. Identifying and describing essential fish habitat is the first step in preventing decreases in biological productivity of pelagic *Sargassum* and other managed or prey species dependent on pelagic *Sargassum*.

The FMP for Pelagic *Sargassum* Habitat of the South Atlantic Region (*Sargassum* FMP) and the Fishery Ecosystem Plan highlight the productivity of pelagic *Sargassum* as being directly dependent on the larval fish utilizing this habitat. Species using pelagic *Sargassum* provide a primary source of nitrogen in an otherwise nutrient poor water column environment. In addition, the relationship between fishes and pelagic *Sargassum* is mutualistic and more important than previously thought. Therefore, the productivity of pelagic *Sargassum* is tightly coupled to associated fish schools and explains how pelagic *Sargassum* sustains growth in oligotrophic (low nutrient) oceanic waters often devoid of dissolved nutrients.

In consideration of conditions limiting growth and survival of *Sargassum* and the known utilization of large rafts of *Sargassum* by early life stages of federally managed fisheries and other marine species, this alternative EFH designation would only encompass the uppermost 10 meters (m) of the marine water column. This area considered for designation as EFH for pelagic *Sargassum* has already been specified as EFH for one or more of the various South Atlantic Council and NOAA Fisheries Service managed fisheries: shrimp, snapper grouper, dolphin and wahoo, coastal migratory pelagics, and highly migratory species.

Preferred Alternative 3 limits the EFH designation to the upper 10 m of the surface as bounded by the Gulf Stream, an alternative developed by NOAA Fisheries Service in the development of the FEIS (NMFS 2002) for the Pelagic *Sargassum* Habitat FMP. The FEIS notes that "This alternative provides the most specific spatial reference to *Sargassum* EFH, insofar as it would limit the EFH to include only those surface waters in the area where *Sargassum* most commonly occurs and where densities are often the highest." In addition, it is also noted that the "Near surface waters represent the primary depth range for *Sargassum* photosynthesis, growth and reproduction." This area is the upper 10 m of the surface of the area shown in **Figure 4-8**. This area represents the same spatial presentation of the Gulf Stream used for existing EFH designations and defined in the associated metadata: (http://ocean.floridamarine.org/efh_coral/dbGroupTOC/metadata/dolphin-wahoo%20efh-hapc.htm).

Designation of near-surface oceanic and nearshore habitats as EFH for pelagic *Sargassum*, as an action independent of any others, would not impact the biological quality of those habitats. However, designation would provide an additional mechanism by which the Council could manage or influence activities which could cause or lead to the degradation of *Sargassum* EFH.

The action alternatives proposed in Action 8 would not result in direct impacts to the biological resources of the west-central Atlantic Ocean. Rather, EFH designation under this option would provide a future opportunity for the South Atlantic Council to establish regulations to protect EFH from fishing activities in the EEZ and to review and recommend EFH conservation measures to protect surface waters from non-fishing activities which are undertaken, authorized, or funded by federal agencies. Similarly, designation of pelagic *Sargassum* EFH would require federal agencies to consult with NOAA Fisheries Service on activities which may adversely affect that habitat.

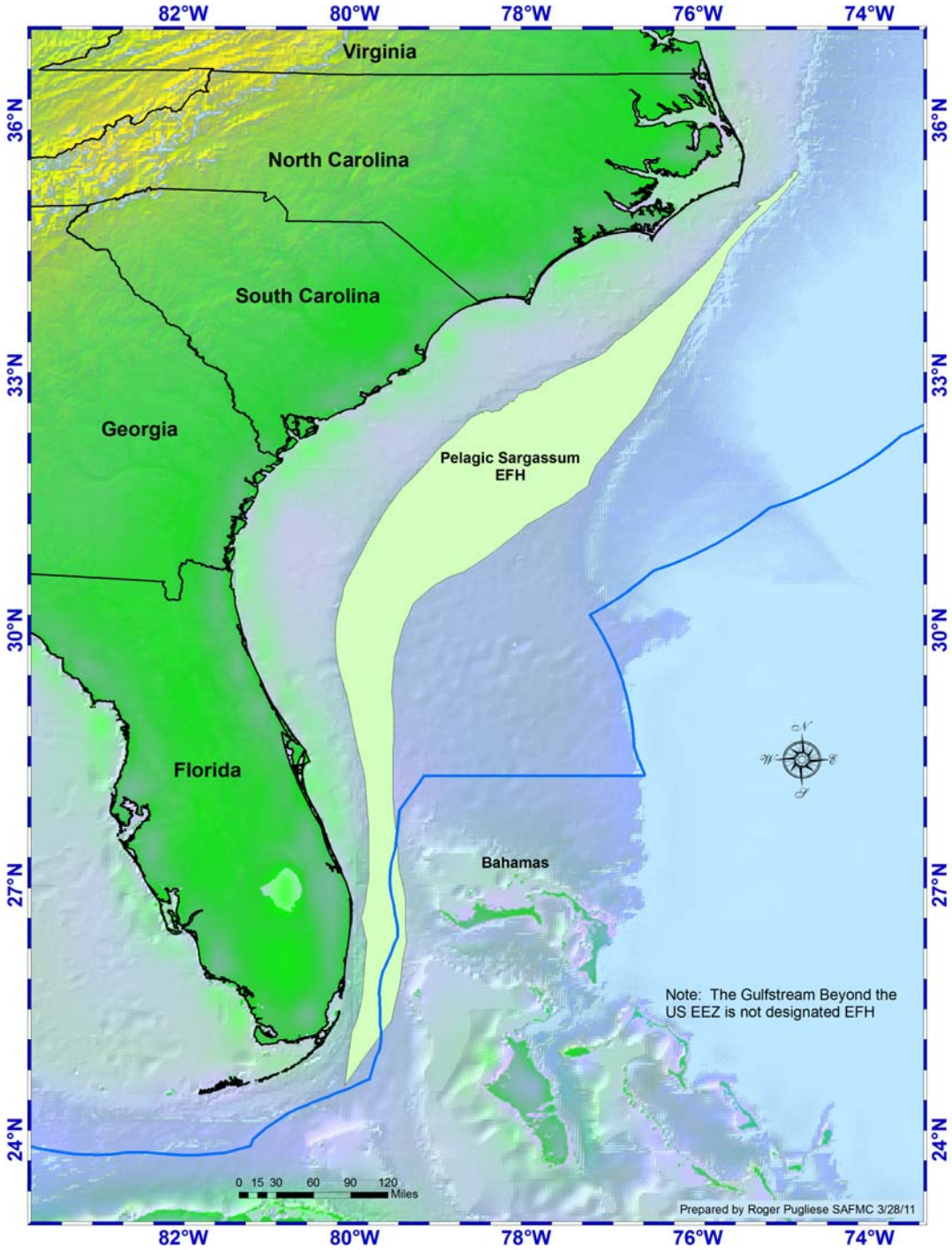


Figure 4-8. Proposed EFH for Pelagic *Sargassum*.

4.8.2 Economic Effects

The identification of EFH is a mandated requirement of an FMP. Therefore, the No Action Alternative would not allow the full implementation of the *Sargassum* FMP and establishment of a platform for future management actions. Also, the South Atlantic Council would be limited in the future in terms of protecting pelagic *Sargassum* habitat and minimizing any possible habitat damage from occurring. This could result in reduced net economic benefits to society in the long-term.

The identification of EFH for pelagic *Sargassum* will not have any direct economic impacts. However, this measure will enable the South Atlantic Council to protect essential fish habitat effectively and take timely actions when necessary which could lead to increased net economic benefits to society. Identification of EFH will require the South Atlantic Council to consider all operations or actions that might interact with or affect the EFH, and may trigger a consultation for any activity that may affect the habitat. The direct effects of additional regulatory consideration would be the financial costs of a protracted regulatory process. Additional effects would accrue to any restrictions imposed as a result of the evaluation of impact of these activities. A consultation may incur costs associated with production delays, project/activity design modification, or mitigation measures. Since any restrictions that may subsequently be placed on these activities are unknown at this time, it is not possible to explicitly describe their effects. However, designation of EFH is expected to increase the likelihood that long-term resource goals are met due to increased protection through consultation requirements. A healthy, sustainable resource is presumed to result in increased long-term economic benefits relative to less protection. Assuming the area is appropriate to the resource, **Preferred Alternative 3** would be expected to result in greater protection of the resource than **Alternative 1 (No Action)** and **Alternative 2** and is expected to increase long-term economic benefits compared **Alternative 1 (No Action)** and **Alternative 2**.

4.8.3 Social Effects

Alternative 1 would not meet Magnuson-Stevens Act mandates to identify EFH. Although there would be few social impacts from no action, it is in the best interest of the South Atlantic Council and fishermen to identify this habitat. Designation of essential pelagic *Sargassum* habitat (**Alternative 2** and **Preferred Alternative 3)** can facilitate expeditious South Atlantic Council action in the future to protect habitat, and is expected to result in long-term social benefits.

There would be few additional social impacts expected from identifying EFH for pelagic *Sargassum*. In some cases, protection of habitat as in **Alternative 2** and **Preferred Alternative 3** could later lead to harvesting restrictions in areas where harvesting normally takes place. **Alternative 1** would be less likely to result in negative short-term impacts on harvesters and processors than **Alternative 2** or **Preferred Alternative 3**.

4.8.4 Administrative Effects

Designation of new EFH and EFH-HAPC would require consideration of all operations or actions that might interact with or affect the EFH, and may trigger a consultation for any activity that may affect the habitat. The direct effects of additional regulatory consideration would be the financial costs of a protracted regulatory process. Additional effects would accrue to any restrictions imposed as a result of the evaluation of impact of these activities. A consultation may incur costs associated with production delays, project/activity design modification, or mitigation measures. Since any restrictions that may subsequently be placed on these activities are unknown at this time, it is not possible to explicitly describe their effects. The Gulf Stream is already designated as EFH for dolphin and wahoo, coastal migratory pelagics, spiny lobster, rock shrimp, and golden crab.

It is worth noting that identification of EFH could alter the process by which permits for activities which impact EFH are issued. The potential for increased restrictions, mitigation, and permitting requirements may have impacts upon the behavior of individuals and agencies seeking permits. The nature and extent of those impacts are unknown and will undoubtedly vary depending upon the individual and/or agency. However, considering the Gulf Stream is already EFH for a number of managed species, it is likely that *Sargassum* would be included as one of potentially affected species and the administrative burden associated with EFH consultation would not be anticipated to increase.

4.8.5 Conclusion

The proposal to designate EFH for pelagic *Sargassum* was presented to the Habitat Advisory Panel in November 2010 and recommended for inclusion into CE-BA 2. CE-BA 2 was approved for public hearings with two proposed definitions for EFH-HAPC by the South Atlantic Council in December 2010. Public hearings were held in January and February 2011. In March 2011, the South Atlantic Council selected **Alternative 3** as preferred, the most significant oceanographic feature supporting *Sargassum* species occurrence, distribution, and transport.

Preferred Alternative 3 also best meets the objectives of the Fishery Management Plan for pelagic *Sargassum* habitat, as amended, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

4.9 Cumulative Effects

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

The magnitude and significance of environmental consequences of the proposed federal actions are analyzed in the context of the cumulative effects of other past, present, and reasonably foreseeable future actions. Verifying the cumulative environmental consequences of the proposed federal actions requires delineating the relationship between multiple actions and the resources, ecosystems, and human communities of concern. The cumulative effects of the alternatives are analyzed by combining (a) the direct effects of the alternatives and (b) the indirect effects of the alternatives with (c) the effects of exogenous factors, as modified by (b). The cumulative effects on the physical, social and economic environments, habitat, protected species and the resources are described below.

4.9.1 Physical Environment

The immediate impact area of this rule is the federal 200-nautical mile limit of the Atlantic off the coasts of North Carolina, South Carolina, Georgia, and east Florida to Key West. Since the boundaries are solely political in nature and do not prohibit immigration and emigration of fish, and fish larvae, the geographic scope of the cumulative effects analysis must be expanded.

In light of the available information, the extent of the boundaries would depend upon the degree of fish immigration/emigration and larval transport, whichever has the greatest geographical range. The cumulative effect analysis cannot establish geographical boundaries in terms of coordinates, but recognizes that the proper geographical boundary to consider effects on the biophysical environment is larger than the entire South Atlantic EEZ. The ranges of affected species are described in Section 3.2. The most measurable and substantial effects would be limited to the South Atlantic region.

Past management of the octocoral, snapper grouper, *Sargassum*, and coastal migratory pelagic fishery, this proposed action, and potential future management of these fisheries is not likely to have negative impacts on the physical environment. The snapper grouper, coastal migratory pelagic, and *Sargassum* fisheries have little interaction with the bottom habitat and are believed to have minimal impact and would not result in long term modification of the physical environment. The octocoral fishery interacts with the bottom

habitat as octocorals are removed from the bottom. However, this fishery is a hand harvested, hand selected fishery and it is expected to result in minimal modification to the physical environment. The proposed actions in this amendment (related to octocorals) would limit the amount of octocoral harvest in the EEZ which will ensure that any modification is minimal.

4.9.2 Habitat and EFH

Reductions in overall fishing effort, as a result of past and current fishery management actions are thought to have had a positive impact on habitat and EFH. Past and future management measures implemented in the Comprehensive EFH Amendment, Amendment 14 to the Snapper Grouper FMP, Amendment 16 to the Snapper Grouper FMP, Amendment 17A to the Snapper Grouper FMP, Amendment 17B Snapper Grouper FMP, CE-BA 1, and those proposed in the CE-BA 2, Comprehensive ACL Amendment, Amendment 10 to the Fishery Management Plan for the Spiny Lobster Fishery of the South Atlantic, Amendment 18 to the Fishery Management Plan for the Coastal Migratory Pelagic Resources in the Atlantic and Gulf of Mexico are also expected to reduce effort in the South Atlantic fisheries.

The CE-BA 2 proposes designation of EFH for *Sargassum* and golden tilefish and the creation of EFH-HAPCs for golden tilefish. These will provide a direct positive impact to EFH.

4.9.3 Fishery Resources

Past and future fishery management actions taken through the FMP process are thought to have had a positive effect on the managed resources. It is anticipated that future management actions could result in additional indirect positive effects on the managed species through actions which reduce and monitor bycatch, protect habitat, and protect ecosystem services.

The actions proposed in this amendment designate ACLs and AMs for the octocoral fishery, ensuring the fishery will not undergo overfishing. Action 4 will reduce the impact of fishing on the snapper grouper and coastal migratory pelagic fisheries in the SMZs. All other actions in this amendment are not expected to have an impact on the fishery resources in the South Atlantic as they pertain to EFH and EFH-HAPCs.

4.9.4 Protected Resources

A description of the protected resources in the action area and the effects determinations can be found in Section 3.2.3. Of the actions proposed by this amendment, Action 5 may impact protected sea turtles in the action area. A 2006 ESA consultation for the snapper grouper fishery determined that the snapper grouper fishery is not likely to adversely affect protected species (NMFS 2006). The Office of Protected Resources has concluded the preferred alternatives under Action 5 would comply with the original Biological Opinion and is not likely to adversely impact protected species. Past and future fishery management actions related to the snapper grouper fishery taken through the FMP process are thought to have had

a positive effect on the protected species as they tend to reduce fishing effort in the area which would reduce any chance for interaction with fishing gear.

Management measures proposed for the octocoral fishery will not be modified in such a way that will be functionally different from the status quo. Therefore, any effects on protected coral species is expected to remain the same.

Management measures proposed for the coastal migratory pelagics fishery will not be modified in such a way that will be functionally different from the status quo. Therefore, any effects on protected species are expected to remain the same.

4.9.5 Social and Economic Environment

The snapper grouper fishery is a highly regulated fishery and continues to be the subject of new management measures from NOAA Fisheries Service. **Appendix G** describes amendments to the snapper grouper FMP under development, which could impact the social and economic environments of the snapper grouper fishery and communities. However, the action proposed in this environmental assessment would modify the existing sea turtle release gear requirements for the snapper grouper fishery and would reduce the social and economic impacts on the fishery.

The actions proposed for the octocoral fishery are expected to have minimal impact on the social and economic environment as it would not reduce or increase the amount of harvest in the fishery from the status quo. Essential Fish Habitat and EFH-HAPC actions are not expected to have impact on the social and economic environment. These specifications may result in better management and oversight of EFH in the future.

4.9.6 Summary of Cumulative Impacts

The proposed federal actions are not expected to compound the cumulative effects on the physical, social and economic environments, habitat, protected species or the fishery resource. Therefore, there are no foreseeable significant additive or interactive effects as a result of the proposed federal actions.

In terms of context and intensity, the proposed federal actions are not anticipated to have any significant effects on the subject marine ecosystem, marine species or human community involved for the following reasons:

1) Management measures proposed for the octocoral fishery will not be modified in such a way that will be functionally different from the status quo.
2) Management measures proposed for the snapper grouper fishery will only modify current gear required for sea turtle handling. The modification will not be functionally different from the status quo and will not increase impacts to protected species. These actions will increase the social and economic benefits to the fishery by reducing the scope of the regulations.

3) Management measures proposed for the snapper grouper and coastal migratory pelagic fishery would reduce potential user conflicts in the SMZs off South Carolina.
4) Specification of EFH and EFH-HAPCs will not have any significant impact on the ecosystem or human community. These specifications may result in better management and oversight of EFH in the future.

The proposed federal actions require no long-term restrictions or operational adjustments to the fisheries in question and, as such, are not anticipated to have any significant impacts that combine with previous impacts.

When combined with the past and potential future management efforts, the overall direct and indirect effects of the proposed federal actions do not produce significant cumulative impacts in the biological, administration and enforcement, economic, social, and cultural environments of the octocoral, snapper grouper, coastal migratory pelagic and *Sargassum* fisheries.

4.10 Unavoidable Adverse Effects

The regulatory actions proposed in CE-BA 2 would apply primarily to the octocoral, snapper grouper coastal migratory pelagic, and *Sargassum* fisheries of the South Atlantic. There are no unavoidable adverse effects expected through the implementation of these actions.

4.11 Effects of the Fishery on the Environment

The biological impacts of the proposed actions are described in **Section 4.0**, including impacts on habitat. No actions proposed by this amendment are expected to have any adverse impacts on EFH or EFH-HAPCs for managed species. This CE-BA 2 designates new EFH for snapper grouper, golden tilefish and *Sargassum*. This CE-BA 2 also creates EFH-HAPCs for snapper grouper species.

4.11.1 Effects on Ocean and Coastal Habitats

The biological impacts of the proposed actions are described in Section 4.1.1; 4.2.1; 4.3.1; 4.4.1; 4.5.1; 4.6.1; 4.7.1; 4.8.1; 4.9.1, including impacts on ocean and coastal habitats. The alternatives proposed by this amendment are not expected to have any adverse effect on the ocean and coastal habitat.

4.11.1.1 Public Health and Safety

The proposed actions are not expected to have any substantial adverse impact on public health or safety.

4.11.2 Endangered Species and Marine Mammals

The biological impacts of the proposed actions are described in 4.1.1; 4.2.1; 4.3.1; 4.4.1; 4.5.1; 4.6.1; 4.7.1; 4.8.1; 4.9.1, including impacts on endangered species and marine

mammals. The proposed actions are not expected to change the level of marine mammal or endangered species impacts from the status quo.

4.12 Irreversible and Irretrievable Commitments of Resources

Irreversible commitments are defined as commitments which cannot be reversed, except perhaps in the extreme long-term, whereas irretrievable commitments are lost for a period of time. None of the actions proposed by this amendment would result in irreversible or irretrievable commitments of resources.

4.13 Monitoring and Mitigation Measures

The proposed actions would have an immediate affect, short-term net revenues of some commercial snapper grouper and coastal migratory pelagics fishermen in the South Atlantic. However, it is not expected that this affect will be significant.

Establishing an ACL for octocorals will require monitoring and enforcement. However, the monitoring programs are not new and have been in operation for some time and will continue. The current monitoring program is described in detail in Section 4.1.1.

4.14 Effects of the Fishery Associated with Climate Change

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

4.15 Unavailable or Incomplete Information

The Council on Environmental Quality, in its implementing regulations for the National Environmental Policy Act, addressed incomplete of unavailable information at 40 CFR 1502.22 (a) and (b). That direction has been considered. There are two tests to be applied: (1) does the incomplete or unavailable information involve "reasonable foreseeable adverse effects…" and (2) is the information about these effects "essential to a reasoned choice among alternatives…"

Stock assessments have not been conducted on octocorals. Status determinations for these species were derived through review of data by the South Atlantic Council and the SSC and the octocoral estimate is considered the best available information.

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Responsible Agency

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

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