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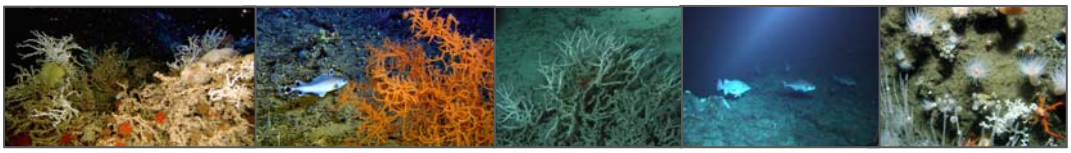
COMPREHENSIVE ECOSYSTEM-BASED AMENDMENT 2 FOR THE SOUTH ATLANTIC REGION



AMENDMENT 7 TO THE FISHERY MANAGEMENT PLAN FOR CORAL, CORAL REEFS, AND LIVE/HARDBOTTOM HABITATS OF THE SOUTH ATLANTIC REGION
AMENDMENT 20 TO THE FISHERY MANAGEMENT PLAN FOR THE SNAPPER GROUPER FISHERY OF THE SOUTH ATLANTIC REGION
~~AMENDMENT 9 TO THE FISHERY MANAGEMENT PLAN FOR THE SHRIMP FISHERY OF THE SOUTH ATLANTIC REGION~~
AMENDMENT 20 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

December 2010

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This is a publication of the South Atlantic Fishery Management Council pursuant to National Oceanic and Atmospheric Administration Award No. FNA05NMF4410004

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
NFMS	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
SAMFC	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:

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FMP Amendments – South Atlantic Fishery Management Council
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January 26, 2009 (Charleston, SC)
January 27, 2009 (New Bern, NC)
February 3, 2009 (Key Largo, FL)
February 4, 2009 (Cocoa Beach, FL)
February 5, 2009 (Pooler, GA)

ABSTRACT

This Comprehensive Ecosystem-Based Amendment 2 (CE-BA 2) consists of regulatory actions that focus on management of the octocoral fishery, modification of management of South Carolina's Special Management Zones, modification of sea turtle release gear requirements for the Snapper Grouper Fishery and non-regulatory actions that designate new EFH and EFH-HAPCs.

Actions in this Comprehensive Ecosystem-Based Amendment 2 would:

- Remove octocorals from the Fishery Management Unit under the Coral FMP.
- Extend the SAFMC's Fishery Management Unit for octocorals into the Gulf of Mexico Fishery Management Council's area of jurisdiction.
- Modify the ACL for octocorals in the South Atlantic.
- Modify management of South Carolina's SMZs.
- Modify Sea Turtle release gear requirements for the Snapper Grouper fishery.

Amend the following FMPs to present spatial information and designate new Essential Fish Habitat and Essential Fish Habitat-Habitat Areas of Particular Concern:
Snapper Grouper Fishery of the South Atlantic; Coral, Coral Reefs and Live/Hardbottom Habitat Fishery Management Plan; Fishery Management Plan for Pelagic *Sargassum*.

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EXECUTIVE SUMMARY

(to be completed)

1 Introduction

1.1 Background

Management of the Federal snapper grouper, dolphin/wahoo, shrimp, coastal migratory pelagic fisheries and Coral and *Sargassum* habitats located off the South Atlantic in the 3-200 nautical mile (nm) U.S. Exclusive Economic Zone is conducted under the Fishery Management Plan for the snapper grouper, dolphin wahoo, shrimp, coastal migratory pelagics, Coral and *Sargassum* (SAFMC 1983) (Figure 1-1). The fishery management plans (FMPs) and their amendments are developed under the Magnuson-Stevens Fishery Conservation and Management Act, other applicable Federal laws, and executive orders (E.O.s) and affect the management of 73 species of snapper grouper, dolphin and wahoo, shrimp, coastal migratory pelagics and Coral and *Sargassum* (Table 1-1).

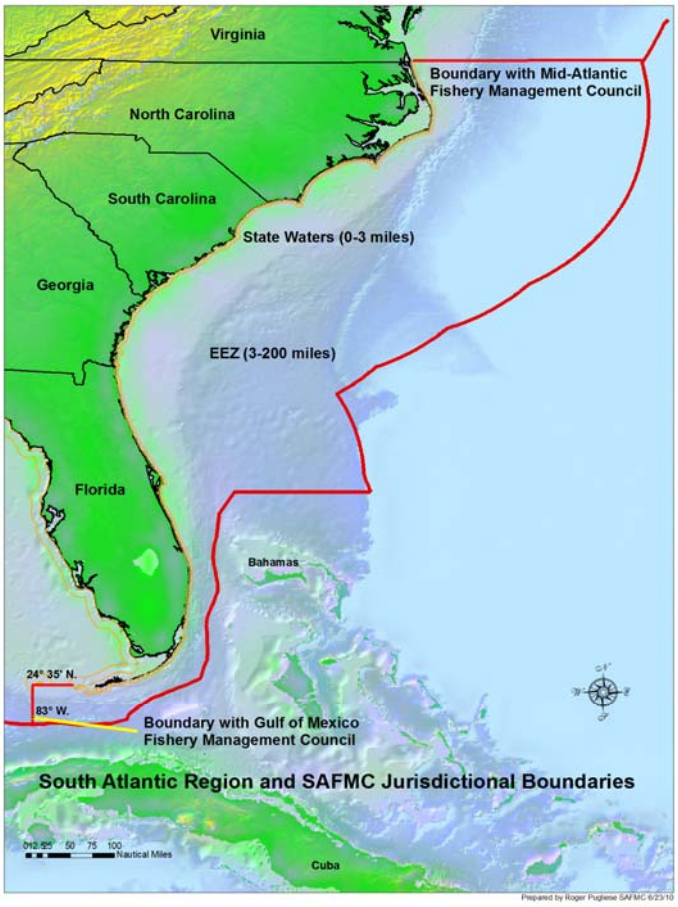

Figure 1-1. Jurisdictional boundaries of the South Atlantic Fishery Management Council.

Table 1-1. Species in the FMUs for Snapper Grouper, Dolphin Wahoo, 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 americanus*

Dolphin Wahoo FMU
Dolphinfish *Coryphaena hippurus*
Wahoo *Acanthocybium solandri*

Coastal Migratory Pelagic FMU
cero *Scomberomous regalis*
cobia *Rachycentron canadum*
king mackerel *Scomberomous cavalla*
Spanish mackerel *Scomberomorus maculates*
little tunny *Euthynnus alleterattus*

Coral FMU
Coral Reefs – hardbottom, deepwater banks, patch reefs and outer banks (as defined in Amendment 1 to the FMP for Coral and Coral Reefs)
Stony Corals – species belonging to Class Hydrozoa, Class Anthozoa, Subclass Zoantharia
Octocorals – Class Anthozoa, Subclass Octocorallia (including sea fans, *Gorgonia ventalina*, *Gorgonia flabellum*)

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

1.2 Purpose and Need

The purpose of CE-BA 2 is to clarify management of the octocoral fishery, modify the ACL for octocorals, modify management in the Special Management Zones, revise sea turtle handling and release guidelines and to designate new EFH and 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 Comprehensive Ecosystem-based Amendment 2 (CE-BA 2) proposes to modify the ACL for octocorals in the South Atlantic region. The current 50,000 colony quota includes South Atlantic and Gulf of Mexico EEZ waters, only, is set at a value much higher than the historical landings history, and the quota has never been reached. The Council is considering an alternative to modify the ACL to include State and EEZ waters in the Gulf and South Atlantic, combined. The Council is also considering removing octocorals from the Fishery Management Unit under the Coral FMP, and extending the management unit for octocorals into the Gulf of Mexico Fishery Management Council's area of jurisdiction.

This amendment would amend Council FMPs as needed to designate new or modify existing EFH and Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs).

An action to modify management of Special Management Zones (SMZs) is also included in this CE-BA 2 including an alternative that would require that harvest (with the use of all non-prohibited fishing gear) and possession of managed species in South Carolina SMZs be limited to the recreational bag limit. This is necessary due to concern about commercial exploitation of state's artificial reefs.

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 meant for larger longline vessels and do not apply easily to the smaller vessels.

1.3 Management Objectives

Management objectives of the Coral, Coral Reefs, and Live/Hardbottom Habitat FMP addressed by this amendment include the following:

1. Minimize, as appropriate, adverse human impacts on coral and coral reefs;
2. Increase public awareness of the importance and sensitivity of coral and coral reefs and;

1.4 History of Management

The following is a summary of management actions for plans amended through this CE-BA 2 (Coral, Snapper Grouper, Shrimp, Coastal Migratory Pelagics and *Sargassum*). Other summaries of Council actions and history of management for other Fishery Management Plans are available online at www.safmc.net.

The Fishery Management Plan for Coral, Coral Reefs, and Live/Hardbottom Habitat of the South Atlantic Region

Management of coral resources was originally established with the joint Gulf of Mexico and South Atlantic Coral Fishery Management Plan (GMFMC & SAFMC 1982). The FMP's intent was to optimize the benefits generated from the coral resource while conserving the coral and coral reefs. Specific management objectives addressed through the FMP were to: (1) develop scientific information necessary to determine feasibility and advisability of harvest of coral; (2) minimize, as appropriate, adverse human impacts on coral and coral reefs; (3) provide, where appropriate, special management for Coral Habitat Areas of Particular Concern (CHAPCs); (4) increase public awareness of the importance and sensitivity of coral and coral reefs; and (5) provide a coordinated management regime for the conservation of coral and coral reefs.

The FMP implemented the following management measures for coral and coral reefs: (1) disallowed any level of foreign fishing and established the domestic annual harvest to equal the Optimum Yield (OY); (2) prohibited the taking of stony corals and sea fans or the destruction of these corals and coral reefs anywhere in the EEZ of the Gulf and South Atlantic Councils' area of jurisdiction; (3) established that stony corals and sea fans taken incidentally in other fisheries must be returned to the water in the general area of capture as soon as possible (with the exception of the groundfish, scallop, or other similar fisheries where the entire unsorted catch is landed, in which case stony corals and sea fans may be landed but not sold); (4) established that the Councils may notify the Secretary of the threat of widespread or localized depletion from overharvest of one or more species of octocorals and recommend specific actions; (5) established a permit system for the use of chemicals for the taking of fish or other organisms that inhabit coral reefs; (6) established a permit system for taking prohibited corals for scientific and educational purposes; and (7) identified Habitat Areas of Particular Concern and established time and area restrictions in Habitat Areas of Particular Concern.

Amendment 1 (GMFMC & SAFMC 1990) implemented the following regulations: (1) included octocorals in the management unit as a controlled species; (2) implemented a combined octocoral quota for the Gulf of Mexico and South Atlantic EEZ of 50,000 individual colonies; (3) stated the Optimum Yield (OY) for coral reefs, stony corals, and sea fans to be zero; (4) included a definition of overfishing; (5) established a permit system to take octocorals; (6) provided reporting requirements for those taking corals under federal permit; (7) included a section on vessel safety considerations; and (8) revised the section on habitat.

Amendment 2 (GMFMC & SAFMC 1994) included the following regulations: (1) defined live rock and added it to the Coral FMP management unit (live rock is defined as living marine organisms or an assemblage thereof attached to a hard substrate including dead coral or rock); (2) redefined allowable octocorals to mean erect, non-encrusting species of the subclass Octocorallia, except the prohibited sea fans, including only the substrate covered by and within one inch of the holdfast; (3) revised management measures to address bycatch of octocorals; (4) provided for different management in the jurisdictional areas of the two Councils by promulgating a separate set of management measures and regulations for the South Atlantic; (5) prohibited all wild live rock harvest north of Dade County, Florida, and prohibited chipping throughout the jurisdiction of the South Atlantic Council; (6) capped

harvest of wild live rock to 485,000 pounds annually until January 1, 1996 when all wild live rock harvest was prohibited; (7) allowed and facilitated aquaculture of live rock in the EEZ and required live rock harvest federal permits; and (8) required a federal permit for harvest and possession of prohibited corals and prohibited live rock from the EEZ for scientific, educational, and restoration purposes.

Amendment 3 (SAFMC 1995a) implemented the following: (1) established a live rock aquaculture permit system for the South Atlantic EEZ; (2) prohibited octocoral harvest north of Cape Canaveral to prevent expansion of the fishery to areas where octocorals constitute a more significant portion of the live/hardbottom habitat; and (3) prohibited anchoring of all fishing vessels in the Oculina Habitat Area of Particular Concern.

Amendment 4/EIS to the South Atlantic Coral FMP, included in the Comprehensive EFH Amendment (SAFMC 1998b) expanded the Oculina Bank Habitat Area of Particular Concern (HAPC) to an area bounded to the west by 80°W., to the north by 28°30'N., to the south by 27°30'N., and to the east by the 100 fathom (600 feet) depth contour. Amendment 4 expanded the Oculina Bank HAPC to include the area closed to rock shrimp harvest. The expanded Oculina Bank HAPC is 60 nautical miles long by about 5 nautical miles wide although the width tracks the 100 fathom (600 foot) depth contour rather than a longitude line. Within the expanded Oculina Bank HAPC area, no person may:

1. Use a bottom longline, bottom trawl, dredge, pot, or trap.
2. If aboard a fishing vessel, anchor, use an anchor and chain, or use a grapple and chain.
3. Fish for rock shrimp or possess rock shrimp in or from the area on board a fishing vessel.

Amendment 5 to the Coral FMP included in the Comprehensive SFA Amendment (SAFMC 1998c) extended the Optimum Yield (OY) definition to include harvest allowances under live rock aquaculture permits.

Amendment 6 to the Coral FMP (SAFMC In review) would establish deepwater Coral HAPCs (CHAPCs), create a "Shrimp Fishery Access Area" within the proposed Stetson-Miami Terrace CHAPC and create "Allowable Golden Crab Fishing Areas" within the proposed Stetson-Miami Terrace and Pourtales Terrace CHAPCs.

The South Atlantic Fishery Ecosystem Plan and Ecosystem-Based Management

The Council, working with many other partners, is developing a Fishery Ecosystem Plan (FEP) which identifies and describes the current suite of knowledge on many parameters in the South Atlantic ecosystem. It is the Council's intent to use the information in the FEP to evaluate the biological, economic, and social conditions in the South Atlantic ecosystem. By reviewing the information on a regional basis the Council would be able to evaluate the impacts of future proposed actions across multiple fisheries, thus facilitating development of management regulations that could apply across FMPs.

History of Management of the South Atlantic Snapper Grouper Fishery

The snapper grouper fishery is highly regulated; some of the species included in this amendment have been regulated since 1983. The following table summarizes actions in each of the amendments to the original FMP, as well as some events not covered in amendment actions.

Table1-2. History of management for the Snapper Grouper Fishery of the South Atlantic region.

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
FMP (1983)	08/31/83	PR: 48 FR 26843 FR: 48 FR 39463	-12" limit – red snapper, yellowtail snapper, red grouper, Nassau grouper -8" limit – black sea bass -4" trawl mesh size -Gear limitations – poisons, explosives, fish traps, trawls -Designated modified habitats or artificial reefs as Special Management Zones (SMZs)
Regulatory Amendment #1 (1986)	03/27/87	PR: 51 FR 43937 FR: 52 FR 9864	-Prohibited fishing in SMZs except with hand-held hook-and-line and spearfishing gear. -Prohibited harvest of goliath grouper in SMZs.
Amendment #1 (1988)	01/12/89	PR: 53 FR 42985 FR: 54 FR 1720	-Prohibited trawl gear to harvest fish south of Cape Hatteras, NC and north of Cape Canaveral, FL. -Directed fishery defined as vessel with trawl gear and ≥200 lbs s-g on board. -Established rebuttable assumption that vessel with s-g on board had harvested such fish in EEZ.
Regulatory Amendment #2 (1988)	03/30/89	PR: 53 FR 32412 FR: 54 FR 8342	-Established 2 artificial reefs off Ft. Pierce, FL as SMZs.
Notice of Control Date	09/24/90	55 FR 39039	-Anyone entering federal wreckfish fishery in the EEZ off S. Atlantic states after 09/24/90 was not assured of future access if limited entry program developed.
Regulatory Amendment #3 (1989)	11/02/90	PR: 55 FR 28066 FR: 55 FR 40394	-Established artificial reef at Key Biscayne, FL as SMZ. Fish trapping, bottom longlining, spear fishing, and harvesting of Goliath grouper prohibited in SMZ.
Amendment #2 (1990)	10/30/90	PR: 55 FR 31406 FR: 55 FR 46213	-Prohibited harvest/possession of goliath grouper in or from the EEZ -Defined overfishing for goliath grouper and other species
Emergency Rule	8/3/90	55 FR 32257	-Added wreckfish to the FMU -Fishing year beginning 4/16/90 -Commercial quota of 2 million pounds -Commercial trip limit of 10,000 pounds per trip
Fishery Closure Notice	8/8/90	55 FR 32635	- Fishery closed because the commercial quota of 2 million pounds was reached
Emergency Rule Extension	11/1/90	55 FR 40181	-extended the measures implemented via emergency rule on 8/3/90
Amendment #3 (1990)	01/31/91	PR: 55 FR 39023 FR: 56 FR 2443	-Added wreckfish to the FMU; -Defined optimum yield and overfishing -Required permit to fish for, land or sell wreckfish; -Required catch and effort reports from selected, permitted vessels;

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
			-Established control date of 03/28/90; -Established a fishing year for wreckfish starting April 16; -Established a process to set annual quota, with initial quota of 2 million pounds; provisions for closure; -Established 10,000 pound trip limit; -Established a spawning season closure for wreckfish from January 15 to April 15; and -Provided for annual adjustments of wreckfish management measures;
Notice of Control Date	07/30/91	56 FR 36052	-Anyone entering federal snapper grouper fishery (other than for wreckfish) in the EEZ off S. Atlantic states after 07/30/91 was not assured of future access if limited entry program developed.

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
Amendment #4 (1991)	01/01/92	PR: 56 FR 29922 FR: 56 FR 56016	-Prohibited gear: fish traps except black sea bass traps north of Cape Canaveral, FL; entanglement nets; longline gear inside 50 fathoms; bottom longlines to harvest wreckfish**; powerheads and bangsticks in designated SMZs off S. Carolina. -defined overfishing/overfished and established rebuilding timeframe: red snapper and groupers ≤ 15 years (year 1 = 1991); other snappers, greater amberjack, black sea bass, red porgy ≤ 10 years (year 1 = 1991) -Required permits (commercial & for-hire) and specified data collection regulations -Established an assessment group and annual adjustment procedure (framework) -Permit, gear, and vessel id requirements specified for black sea bass traps. -No retention of snapper grouper spp. caught in other fisheries with gear prohibited in snapper grouper fishery if captured snapper grouper had no bag limit or harvest was prohibited. If had a bag limit, could retain only the bag limit. -8" limit – lane snapper -10" limit – vermilion snapper (recreational only) -12" limit – red porgy, vermilion snapper (commercial only), gray, yellowtail, mutton, schoolmaster, queen, blackfin, cubera, dog, mahogany, and silk snappers -20" limit – red snapper, gag, and red, black, scamp, yellowfin, and yellowmouth groupers. -28" FL limit – greater amberjack (recreational only) -36" FL or 28" core length – greater amberjack (commercial only) -bag limits – 10 vermilion snapper, 3 greater amberjack -aggregate snapper bag limit – 10/person/day, excluding vermilion snapper and allowing no more than 2 red snappers -aggregate grouper bag limit – 5/person/day, excluding Nassau and goliath grouper, for which no retention (recreational & commercial) is allowed -spawning season closure – commercial harvest greater amberjack > 3 fish bag prohibited in April south of Cape Canaveral, FL -spawning season closure – commercial harvest mutton snapper >snapper aggregate prohibited during May and June -charter/headboats and excursion boat possession limits extended

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
Amendment #5 (1991)	04/06/92	PR: 56 FR 57302 FR: 57 FR 7886	-Wreckfish: established limited entry system with ITQs; required dealer to have permit; rescinded 10,000 lb. trip limit; required off-loading between 8 am and 5 pm; reduced occasions when 24-hour advance notice of offloading required for off-loading; established procedure for initial distribution of percentage shares of TAC
Emergency Rule	8/31/92	57 FR 39365	-Black Sea Bass (bsb): modified definition of bsb pot; allowed multi-gear trips for bsb; allowed retention of incidentally-caught fish on bsb trips
Emergency Rule Extension	11/30/92	57 FR 56522	-Black Sea Bass: modified definition of bsb pot; allowed multi-gear trips for bsb; allowed retention of incidentally-caught fish on bsb trips
Regulatory Amendment #4 (1992)	07/06/93	FR: 58 FR 36155	-Black Sea Bass: modified definition of bsb pot; allowed multi-gear trips for bsb; allowed retention of incidentally-caught fish on bsb trips
Regulatory Amendment #5 (1992)	07/31/93	PR: 58 FR 13732 FR: 58 FR 35895	-Established 8 SMZs off S. Carolina, where only hand-held, hook-and-line gear and spearfishing (excluding powerheads) was allowed.
Amendment #6 (1993)	07/27/94	PR: 59 FR 9721 FR: 59 FR 27242	-commercial quotas for snowy grouper, golden tilefish -commercial trip limits for snowy grouper, golden tilefish, speckled hind, and warsaw grouper -include golden tilefish in grouper recreational aggregate bag limits -prohibited sale of warsaw grouper and speckled hind -100% logbook coverage upon renewal of permit -creation of the *Oculina* Experimental Closed Area -data collection needs specified for evaluation of possible future IFQ system
Amendment #7 (1994)	01/23/95	PR: 59 FR 47833 FR: 59 FR 66270	-12” FL – hogfish -16” TL – mutton snapper -required dealer, charter and headboat federal permits -allowed sale under specified conditions -specified allowable gear and made allowance for experimental gear -allowed multi-gear trips in N. Carolina -added localized overfishing to list of problems and objectives -adjusted bag limit and crew specs. for charter and head boats -modified management unit for scup to apply south of Cape Hatteras, NC -modified framework procedure
Regulatory Amendment #6 (1994)	05/22/95	PR: 60 FR 8620 FR: 60 FR 19683	Established actions which applied only to EEZ off Atlantic coast of FL: Bag limits – 5 hogfish/person/day (recreational only), 2 cubera snapper/person/day > 30” TL; 12” TL – gray triggerfish
Notice of Control Date	04/23/97	62 FR 22995	-Anyone entering federal bsb pot fishery off S. Atlantic states after 04/23/97 was not assured of future access if limited entry program developed.

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
Amendment #8 (1997)	12/14/98	PR: 63 FR 1813 FR: 63 FR 38298	-established program to limit initial eligibility for snapper grouper fishery: Must demonstrate landings of any species in SG FMU in 1993, 1994, 1995 or 1996; and have held valid SG permit between 02/11/96 and 02/11/97. -granted transferable permit with unlimited landings if vessel landed ≥ 1,000 lbs. of snapper grouper spp. in any of the years -granted non-transferable permit with 225 lb. trip limit to all other vessels -modified problems, objectives, OY, and overfishing definitions -expanded Council's habitat responsibility -allowed retention of snapper grouper spp. in excess of bag limit on permitted vessel with a single bait net or cast nets on board -allowed permitted vessels to possess filleted fish harvested in the Bahamas under certain conditions.
Regulatory Amendment #7 (1998)	01/29/99	PR: 63 FR 43656 FR: 63 FR 71793	-Established 10 SMZs at artificial reefs off South Carolina.
Interim Rule Request	1/16/98		-Council requested all Amendment 9 measures except black sea bass pot construction changes be implemented as an interim request under MSA
Action Suspended	5/14/98		-NMFS informed the Council that action on the interim rule request was suspended
Emergency Rule Request	9/24/98		-Council requested Amendment 9 be implemented via emergency rule
Request not Implemented	1/22/99		-NMFS informed the Council that the final rule for Amendment 9 would be effective 2/24/99; therefore they did not implement the emergency rule

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
Amendment #9 (1998)	2/24/99	PR: 63 FR 63276 FR: 64 FR 3624	-Red porgy: 14" length (recreational and commercial); 5 fish rec. bag limit; no harvest or possession > bag limit, and no purchase or sale, in March and April. -Black sea bass: 10" length (recreational and commercial); 20 fish rec. bag limit; required escape vents and escape panels with degradable fasteners in bsb pots -Greater amberjack: 1 fish rec. bag limit; no harvest or possession > bag limit, and no purchase or sale, during April; quota = 1,169,931 lbs; began fishing year May 1; prohibited coring. -Vermilion snapper: 11" length (recreational) Gag: 24" length (recreational); no commercial harvest or possession > bag limit, and no purchase or sale, during March and April -Black grouper: 24" length (recreational and commercial); no harvest or possession > bag limit, and no purchase or sale, during March and April. -Gag and Black grouper: within 5 fish aggregate grouper bag limit, no more than 2 fish may be gag or black grouper (individually or in combination) -All SG without a bag limit: aggregate recreational bag limit 20 fish/person/day, excluding tomtate and blue runners -Vessels with longline gear aboard may only possess snowy, warsaw, yellowedge, and misty grouper, and golden, blueline and sand tilefish.
Amendment #9 (1998) resubmitted	10/13/00	PR: 63 FR 63276 FR: 65 FR 55203	-Commercial trip limit for greater amberjack
Regulatory Amendment #8 (2000)	11/15/00	PR: 65 FR 41041 FR: 65 FR 61114	-Established 12 SMZs at artificial reefs off Georgia; revised boundaries of 7 existing SMZs off Georgia to meet CG permit specs; restricted fishing in new and revised SMZs
Emergency Interim Rule	09/08/99, expired 08/28/00	64 FR 48324 and 65 FR 10040	-Prohibited harvest or possession of red porgy.
Emergency Action	9/3/99	64 FR 48326	-Reopened the Amendment 8 permit application process
Amendment #10 (1998)	07/14/00	PR: 64 FR 37082 and 64 FR 59152 FR: 65 FR 37292	-Identified EFH and established HAPCs for species in the SG FMU.

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Amendment #11 (1998d)	12/02/99	PR: 64 FR 27952 FR: 64 FR 59126	-MSY proxy: goliath and Nassau grouper = 40% static SPR; all other species = 30% static SPR -OY: hermaphroditic groupers = 45% static SPR; goliath and Nassau grouper = 50% static SPR; all other species = 40% static SPR -Overfished/overfishing evaluations: BSB: overfished (MSST=3.72 mp, 1995 biomass=1.33 mp); undergoing overfishing (MFMT=0.72, F1991-1995=0.95) Vermilion snapper: overfished (static SPR = 21-27%). Red porgy: overfished (static SPR = 14-19%). Red snapper: overfished (static SPR = 24-32%) Gag: overfished (static SPR = 27%) Scamp: no longer overfished (static SPR = 35%) Speckled hind: overfished (static SPR = 8-13%) Warsaw grouper: overfished (static SPR = 6-14%) Snowy grouper: overfished (static SPR = 5=15%) White grunt: no longer overfished (static SPR = 29-39%) Golden tilefish: overfished (couldn't estimate static SPR) Nassau grouper: overfished (couldn't estimate static SPR) Goliath grouper: overfished (couldn't estimate static SPR) -overfishing level: goliath and Nassau grouper = F>F40% static SPR; all other species: = F>F30% static SPR Approved definitions for overfished and overfishing. MSST = [(1-M) or 0.5 whichever is greater]*B_{MSY}. MFMT = F_{MSY}
Amendment #12 (2000)	09/22/00	PR: 65 FR 35877 FR: 65 FR 51248	-Red porgy: MSY=4.38 mp; OY=45% static SPR; MFMT=0.43; MSST=7.34 mp; rebuilding timeframe=18 years (1999=year 1); no sale during Jan-April; 1 fish bag limit; 50 lb. bycatch comm. trip limit May-December; modified management options and list of possible framework actions.
Amendment #13A (2003)	04/26/04	PR: 68 FR 66069 FR: 69 FR 15731	-Extended for an indefinite period the regulation prohibiting fishing for and possessing snapper grouper spp. within the *Oculina* Experimental Closed Area.
Notice of Control Date	10/14/05	70 FR 60058	-The Council is considering management measures to further limit participation or effort in the commercial fishery for snapper grouper species (excluding Wreckfish).
Amendment #13C (2006)	10/23/06	PR: 71 FR 28841 FR: 71 FR 55096	- End overfishing of snowy grouper, vermilion snapper, black sea bass, and golden tilefish. Increase allowable catch of red porgy. Year 1 = 2006. 1. Snowy Grouper Commercial: Quota (gutted weight) = 151,000 lbs gw in year 1, 118,000 lbs gw in year 2, and 84,000 lbs gw in year 3 onwards. Trip limit = 275 lbs gw in year 1, 175 lbs gw in year 2, and 100 lbs gw

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
			in year 3 onwards. Recreational: Limit possession to one snowy grouper in 5 grouper per person/day aggregate bag limit. 2. Golden Tilefish Commercial: Quota of 295,000 lbs gw, 4,000 lbs gw trip limit until 75% of the quota is taken when the trip limit is reduced to 300 lbs gw. Do not adjust the trip limit downwards unless 75% is captured on or before September 1. Recreational: Limit possession to 1 golden tilefish in 5 grouper per person/day aggregate bag limit. 3. Vermilion Snapper Commercial: Quota of 1,100,000 lbs gw. Recreational: 12" size limit. 4. Black Sea Bass Commercial: Commercial quota (gutted weight) of 477,000 lbs gw in year 1, 423,000 lbs gw in year 2, and 309,000 lbs gw in year 3 onwards. Require use of at least 2" mesh for the entire back panel of black sea bass pots effective 6 months after publication of the final rule. Require black sea bass pots be removed from the water when the quota is met. Change fishing year from calendar year to June 1 – May 31. Recreational: Recreational allocation of 633,000 lbs gw in year 1, 560,000 lbs gw in year 2, and 409,000 lbs gw in year 3 onwards. Increase minimum size limit from 10" to 11" in year 1 and to 12" in year 2. Reduce recreational bag limit from 20 to 15 per person per day. Change fishing year from the calendar year to June 1 through May 31. 5. Red Porgy Commercial and recreational 1. Retain 14" TL size limit and seasonal closure (retention limited to the bag limit); 2. Specify a commercial quota of 127,000 lbs gw and prohibit sale/purchase and prohibit harvest and/or possession beyond the bag limit when quota is taken and/or during January through April; 3. Increase commercial trip limit from 50 lbs ww to 120 red porgy (210 lbs gw) during May through December; 4. Increase recreational bag limit from one to three red porgy per person per day.
Notice of Control Date	3/8/07	72 FR 60794	-The Council may consider measures to limit participation in the snapper grouper for-hire fishery
Amendment #14 (2007) Sent to NMFS 7/18/07	2/12/09	PR: 73 FR 32281 FR: 74 FR 1621	-Establish eight deepwater Type II marine protected areas (MPAs) to protect a portion of the population and habitat of long-lived deepwater snapper grouper species.
Amendment #15A (2007)	3/14/08	73 FR 14942	- Establish rebuilding plans and SFA parameters for snowy grouper, black sea bass, and red porgy.
Amendment #15B (2008b)	2/15/10	PR: 74 FR 30569 FR: 74 FR 58902	- Prohibit the sale of bag-limit caught snapper grouper species.

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
			-Reduce the effects of incidental hooking on sea turtles and smalltooth sawfish. - Adjust commercial renewal periods and transferability requirements. - Implement plan to monitor and assess bycatch, - Establish reference points for golden tilefish. - Establish allocations for snowy grouper (95% com & 5% rec) and red porgy (50% com & 50% rec).
Amendment #16 (SAFMC 2008c)	7/29/09	PR: 74 FR 6297 FR: 74 FR 30964	-Specify SFA parameters for gag and vermilion snapper -For gag grouper: Specify interim allocations 51%com & 49%rec; rec & com spawning closure January through April; directed com quota=348,440 pounds gutted weight; reduce 5-grouper aggregate to 3-grouper and 2 gag/black to 1 gag/black and exclude captain & crew from possessing bag limit. -For vermilion snapper: Specify interim allocations 68%com & 32%rec; directed com quota split Jan-June=168,501 pounds gutted weight and 155,501 pounds July-Dec; reduce bag limit from 10 to 4 and a rec closed season October through May 15. In addition, the NMFS RA will set new regulations based on new stock assessment. -Require dehooking tools.
Amendment #17A (TBD)	TBD	TBD	-Specify an ACL and an AM for red snapper with management measures to reduce the probability that catches will exceed the stocks' ACL -Specify a rebuilding plan for red snapper -Specify status determination criteria for red snapper -Specify a monitoring program for red snapper
Amendment #17B (TBD)	TBD	TBD	-Specify ACLs, ACTs, and AMs, where necessary, for 9 species undergoing overfishing. -Modify management measures as needed to limit harvest to the ACL or ACT. -Update the framework procedure for specification of total allowable catch.
Notice of Control Date	12/4/08	TBD	Establishes a control date for the golden tilefish fishery of the South Atlantic
Notice of Control Date	12/4/08	TBD	Establishes control date for black sea bass pot fishery of the South Atlantic

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
Amendment 18 (TBD)	TBD	TBD	-Extend the range of the snapper-grouper FMP north -Limit participation and effort in the golden tilefish fishery -Modifications to management of the black sea bass pot fishery -Separate snowy grouper quota into regions/states -Separate the gag recreational allocation into regions/states -Change the golden tilefish fishing year -Improve the accuracy, timing, and quantity of fisheries statistics -Designate EFH in new northern areas
Amendment 19	TBD	TBD	-Establish deepwater coral HAPCs
Amendment 20	TBD	TBD	-Update wreckfish ITQ according to reauthorized MSFCMA -Establish ACLs, AMs, and management reference points for wreckfish fishery
Comprehensive ACL Amendment	TBD	TBD	-Establish ABC control rules, establish ABCs, ACTs, and AMs for species not undergoing overfishing -Remove some species from South Atlantic FMUs -Specify allocations among the commercial, recreational, and for-hire sectors for species not undergoing overfishing -Limit the total mortality for federally managed species in the South Atlantic to the ACTs -Address spiny lobster issues.

2 Management Alternatives

This section outlines the proposed actions and alternatives considered by the Council. A complete analysis of these alternatives can be found in **Section 4.0.** These alternatives were identified and developed over a number of years, with input from numerous sources, and through multiple processes, including the scoping process conducted for the CE-BA 2, FEP and CE-BA 1, meetings of the Council, the Council's Habitat and Ecosystem Committees, Habitat and Environmental Protection Advisory Panel, Coral Advisory Panel, and Scientific and Statistical Committee. Alternatives the Council considered during the development of this amendment and/or presented at the first round of public hearings but eliminated from further detailed study are described in **Appendix A**. The Council developed the actions in the amendment with a focus on Magnuson-Stevens Act sections 303(b)(2)(A), 303(b)4, 303(b)(12), and 303(b)(14).

2.1 Action 1. Remove octocorals from the Fishery Management Unit (FMU) under the South Atlantic Coral FMP.

Alternative 1. No action. Do not remove octocorals from the FMU under the South Atlantic Coral FMP.
Alternative 2. Remove octocorals from the FMU.
Alternative 3. Remove octocorals from the FMU and delegate management of the octocoral fishery to the State of Florida.

2.1.1 Comparison of Alternatives

Alternative 1 (No action) would leave the management for South Atlantic coral resources unchanged.

Octocoral harvest is managed under the Council's Coral FMP and subsequent amendments. However, because the majority of the harvest occurs in state waters, the Florida Fish and Wildlife Commission (FWC) is responsible for most of the management, implementation and enforcement of regulations. In 1990, Amendment 1 to the Coral FMP (SAFMC & GMFMC 1990) established a total allowable harvest for commercial harvesters of octocorals at 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.

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. Octocorals are defined in the FWC marine life rule as any erect, nonencrusting species of the Subclass Octocorallia, except for the common sea an and Venus sea fan. Harvest of these sea fans is prohibited in Florida waters. There are no commercial bag 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 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, 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.

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

	Alternative 1		
Biological			
Economic			
Social			
Administrative			

2.1.2 Conclusion

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.

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.

Discussion

The GMFMC must first remove octocorals from their Coral and Coral Reefs Fishery Management Plan and request that the Secretary of Commerce designate the South Atlantic Fishery Management Council to manage octocorals throughout their range.

2.2.1 Comparison of Alternatives

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

	Alternative 1					
Biological						
Economic						
Social						
Administrative						

2.2.2 Conclusion

2.3 Action 3. Modify the Allowable 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 = 50,000 colonies in the South Atlantic and Gulf of Mexico EEZ.

The IPT recommends changing the language of this alternative to reflect: ***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 for octocorals to 50,000 colonies in the South Atlantic and Gulf of Mexico for State and EEZ waters combined.

The IPT recommends changing the language of this alternative to reflect: ***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.*

2.3.1 Comparison of alternatives

In 2006 the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) was re-authorized and included a number of changes to improve conservation of managed fishery resources. The goals require that conservation and management measures "shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry". Included in these changes are requirements that the Regional Councils must establish both a mechanism for specifying annual catch limits (ACLs) at a level such that overfishing does not occur in the fishery and accountability measures (AMs). AMs are management controls to prevent the ACLs from being exceeded and to correct by either in-season or post-season measures if they do occur.

The ACL is set by the Council, but begins with specifying an overfishing limit (OFL), which is the yield above which overfishing occurs. Once an OFL is specified, an acceptable biological catch (ABC) level is recommended by the Council's Scientific and Statistical Committee (SSC). The ABC is based on the OFL and takes into consideration scientific uncertainty. The OFL and ABC are set by scientists, whereas ACLs are set by managers. These measures must be implemented by 2010 for all stocks experiencing overfishing and 2011 for all others.

Amendment 1 to the Fishery Management Plan for Coral, Coral Reefs and Live/Hardbottom Habitat (Coral FMP; SAFMC & GMFMC 1990) established a 50,000-colony combined quota for octocoral harvest in federal waters of the South Atlantic and Gulf of Mexico. This status quo is the current ACL for octocorals in the South Atlantic and Gulf of Mexico EEZ. The ACL also serves as a status quo AM, once the federal quota of 50,000 colonies is met, the fishery is closed in federal waters. Florida state regulations correspond to this AM and close state waters to commercial harvest of octocorals when the 50,000 colony quota is met in federal waters.

While there is currently no Maximum Sustainable Yield (MSY) specified for the octocoral fishery because of a lack of sufficient data on biomass and mortality, and catch and effort data, the 50,000 colony quota and AM in place serve as a functional equivalent. The Coral FMP (SAFMC & GMFMC 1982) cited lack of information to arrive at an MSY estimate. Amendment 1 (SAFMC 1990) established a combined annual quota for the Gulf and South Atlantic federal waters of 50,000 octocoral colonies. Amendment 5 (SAFMC 1998) did not set an MSY but established OY at the harvest level of 50,000 colonies combined for the Gulf and South Atlantic EEZ.

In April 2010 the SSC met to discuss development of an ABC control rule for unassessed stocks, including octocorals. The SSC received information on landings and possible reference points for corals in a presentation made at their April 2010 meeting. The 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 unassessed (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 FL FWC, UNC-Wilmington, and UGA) suggest relatively high octocoral abundance in the historically known distribution area (Florida Keys). Based on: (1) the unique characteristics of this fishery (e.g., organisms are harvested and sold live to wholesale and retail dealers and aquarium owners; commercial octocoral collectors only make trips when they have an order to fill for specific organisms), (2) the fact that the fishery is small and effort/participation in Florida waters (i.e., where most of the harvest comes from) is capped by a limited entry program, and (3) the fact that there are no signs of local depletion in areas where the fishery operate, or any other indication that the fishery has been operating at unsustainable levels, the SSC recommended no changes to the current quota and recommended an ABC of 50,000 colonies annually for Gulf and South Atlantic EEZ waters combined. The SSC was asked to clarify their ABC recommendation during their November 2010 meeting. They discussed that 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 that it was their intent to include Gulf and South Atlantic EEZ and state waters in their ABC recommendation for octocorals.

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

	Alternative 1					
Biological						
Economic						

Social						
Administrative						

2.3.2 Conclusion

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

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

Alternative 2. Limit harvest and possession of snapper grouper species (with the use of all non-prohibited fishing gear) in South Carolina's Special Management Zones to the recreational bag limit.

> **Sub-alternative 2A.** Prohibit use of hand spear and spear guns in South Carolina SMZs.

Alternative 3. Limit harvest and possession of CMP species (with the use of all non-prohibited fishing gear) in South Carolina's Special Management Zones to the recreational bag limit.

> **Sub-alternative 3A.** Prohibit use of hand spear and spear guns in South Carolina SMZs.

IPT recommends transferring Alternative 4, prohibit use of hand spear and spear guns in South Carolina SMZs, to sub-alternatives 2A and 3A.

2.4.1 Comparison of Alternatives

In South Carolina, almost all of the artificial reefs 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. For this reason the use of certain types of fishing gear within the boundaries of these SMZ reefs was prohibited. However, while the use of bangsticks (powerheads) by divers to harvest snapper grouper species is prohibited on the state's SMZ reefs and in the EEZ off South Carolina, there are no similar restrictions or prohibitions on the use of conventional spearguns or hand spears. Properly licensed and permitted commercial snapper grouper fishermen may legally use spearguns or hand spears to harvest commercially allowable quantities of these species on the state's offshore SMZs. Recreational constituents have voiced concerns over the presence of commercial snapper-grouper fishing vessels operating on permitted offshore artificial reef sites. They claim that this practice has placed the reef fish populations in these areas at risk and it is not in keeping with the intended purpose of the SMZs. Alternative 1 (No action) would not address the commercial fishing occurring in the SMZs. Alterantive 2 and 3 would address commercial fishing in the SMZs by limiting each fishermen to the bag limit. Sub-alternatives 2a and 3a would eliminate all commercial and recreational diving in the SMZs both snapper grouper and coastal migratory pelagic species.

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

	Alternative 1					
Biological						
Economic						
Social						
Administrative						

2.4.2 Conclusion

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

Alternative 1. No Action. Maintain current sea turtle release gear requirements for the Snapper grouper fishery in federal waters of the South Atlantic. 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) (see Appendix X) 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. Modify the approved specifications for line cutters, bolt cutters, and dehookers required onboard federally permitted snapper-grouper vessels.

Alternative 3. Modify the current gear specifications component of the regulations to require dehooking and disentanglement gear of an appropriate size and strength relative to tackle deployed for fishing.

> *For example: 50 CFR 635.21 Construction. A long-handled dehooker must be constructed of a 5/16–inch (7.94 mm) 316 L stainless steel rod. A 5–inch (12.7–cm) tube T-handle of 1–inch (2.54 cm) outside diameter is recommended, but not*

required. The design should be such that a fish hook can be rotated out, without pulling it out at an angle. The dehooking end must be blunt with all edges rounded. The device must be of a size appropriate to secure the range of hook sizes and styles used in the pelagic longline fishery targeting swordfish and tuna.

Alternative 4. 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. Require fishermen to follow the sea turtle handling and release guidelines. Fishermen would still be required to comply with all current sea turtle release guidelines.

Alternative 5. Require all sea turtle 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.

Alternative 6. Track the same turtle release gear requirements for the Gulf of Mexico, which are dependent upon freeboard heights of 4 feet or less.

Sub-Alternative 6a. Modify the gear specifications for line cutters, dehookers, and bolt cutters for vessels with freeboard height of 4 feet or less.

Sub-Alternative 6b. Modify the gear specifications for line cutters, dehookers, and bolt cutters for all federally permitted snapper-grouper vessels.

2.5.1 Comparison of Alternatives

Current sea turtle release gear requirements were established through Amendment 15B (SAFMC, 2009). Amendment 15B requires 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 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.

Since the Amendment's approval and implementation, some concerns have been raised regarding the appropriateness of several required sea turtle handling and release gear. Therefore, the following proposed amendment action has been developed to address those concerns.

Current Amendment 15B sea turtle release gear requirements include the same dehooking and disentanglement gear required for the pelagic longline fishery despite the fact that many snapper-grouper fishermen fish with much lighter rod and reel type fishing gear. For those using rod and reel, all dehooking and disentanglement gear required in the pelagic longline fishery may not be appropriate for use with the lighter tackle. The dehooking and disentanglement tools that would be included in this potential action are the line cutter which must be capable of cutting 2.0–2.1 mm (0.078 in -0.083 in) monofilament line (400–lb test)

or polypropylene multistrand material known as braided or tarred mainline; bolt cutters, which must be able to cut hard metals, such as stainless or carbon steel hooks, up to 1/4–inch (6.35 mm) diameter; and dehookers built out of 5/16" stainless steel. These items were intended for use with pelagic longline tackle, and are therefore relatively "heavy duty." The effectiveness and necessity of these dehooking and disentanglement tools when used with lighter rod and reel tackle has been called into question. Therefore, the Council has been asked to consider developing an amendment action that would re-address and possibly modify sea turtle release gear requirements for the snapper-grouper fishery.

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

	Alternative 1					
Biological						
Economic						
Social						
Administrative						

2.5.2 Conclusion

~~**Action 6. Amend the Shrimp Fishery Management Plan (FMP) to designate new Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs).**~~
~~**Alternative 1. No action.** Do not amend the Shrimp FMP to designate new Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs).~~
~~**Alternative 2.** Amend the Shrimp FMP to designate the new Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs):~~

~~**Sub-Alternative 2a.** Bulls Bay, South Carolina (for penaeid shrimp)~~
~~**Sub-Alternative 2b 2a.** Ashepoo, Combahee and Edisto (ACE) Basin, South Carolina (for penaeid shrimp)~~

**Habitat Conservation Division staff and Council staff recommend removal of this action. They suggest the EFH designation is not needed for these areas.

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).
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 ~~soft bottom substrate comprised of mud, sand, or clay; burrows found in soft bottom~~; irregular

bottom comprised of troughs and terraces inter-mingled with sand, mud, or shell hash bottom. Mud-clay bottoms in depths of 150-225 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.

**Sub-alternative 2a and 2b have been reworded based upon recommendation by the IPT.

Alternative 3. Designate EFH-HAPCs for the snapper grouper complex to include the deepwater marine protected areas (MPAs).

2.6.1 Comparison of Alternatives

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

	Alternative 1	**Alternative 2a**	**Alternative 2b**
Biological	-	+	+
Economic	-+	+	+
Social	-	+	+
Administrative	+-	-	-

2.6.2 Conclusion

~~**Action 7. Amend the Coastal Migratory Pelagics Fishery Management Plan (FMP) to designate new Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs).**~~
~~**Alternative 1. No action.** Do not amend the Coastal Migratory Pelagics FMP to designate new Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs).~~
~~**Alternative 2.** Amend the Coastal Migratory Pelagics FMP to designate new Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs):~~
~~**Sub-Alternative 2a.** Bulls Bay, SC~~
~~**Sub-Alternative 2b 2a.** Ashepoo, Combahee and Edisto (ACE) Basin, SC~~

**Habitat Conservation Division staff and Council staff recommend removal of this action. They suggest the EFH designation is not needed for these areas.

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 EFH-HAPCs
Alternative 2. Amend the Coral FMP to designate the Deepwater Coral HAPCs as EFH-HAPCs.

2.7.1 Comparison of Alternatives

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

	Alternative 1	Alternative 2a
Biological	-	+
Economic	-+	+
Social	-	+
Administrative	+-	-

2.7.2 Conclusion

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

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

	Alternative 1	Alternative 2	Alternative 3
Biological	-	+	+
Economic	-	+-	+
Social	-	+	+
Administrative	+	-	-

2.8.2 Conclusion

2.9 Action 9. Amend the Fishery Management Plan (FMP) for Pelagic Sargassum Habitat to designate EFH-HAPCs

Alternative 1. No action. Do not amend the *Sargassum* FMP to designate EFH-HAPCs
Alternative 2. Amend the *Sargassum* FMP to designate one or more of the following EFH-HAPCs

Sub-Alternative 2a. The Charleston Bump Complex
Sub-Alternative 2b. The Point, NC

2.9.1 Comparison of Alternatives

Table 2-9. Summarized comparison of the impacts among alternatives for Action 9.

	Alternative 1	Alternative 2a	Alternative 2b
Biological	-	+	+
Economic	-	+-	+-
Social	-	+	+
Administrative	+	-	-

2.9.2 Conclusion

3 Affected Environment

3.1 Habitat

3.1.1 Description and distribution

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. 2007). Nearshore of the Inner Reef is a series of nearshore ridges (Moyer 2003; Banks et al. 2007, Walker et al. 2007).

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 (Beaver et al. 2005).

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 (Beaver et al. 2005, 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).

3.1.2

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 coral 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 gorgonin, 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 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 Complex 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.

3.2.2 Other Affected Species

3.2.3 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 MMPA and six are also listed as endangered under the Endangered Species Act (i.e., sperm, sei, fin, blue, humpback, and North Atlantic right whales). Other species listed under the Endangered Species Act 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.

3.2.3.1 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 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.

Species under U.S. Fish and Wildlife Service (USFWS) Jurisdiction:

Endangered

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.

3.2.3.1.1 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, Lanyan *et al.* 1989).

3.2.3.1.2 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. comm. 2006). Smalltooth sawfish feed primarily on fish. Mullet, jacks, and ladyfish are believed to be their primary food resources (Simpfendorfer 2001). Smalltooth sawfish also prey on crustaceans (mostly shrimp and crabs) by disturbing bottom sediment with their saw (Norman and Fraser 1938, Bigelow and Schroeder 1953).

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 reinitiation 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.

3.2.3.1.3 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).

3.2.3.2 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.

<u>List of Marine Species of Concern in the Southeastern United States</u>

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)

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

3.3 Essential Fish Habitat

The Magnuson-Stevens Act defines EFH as "all waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity." The 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. Water quality, including but not limited to nutrient levels, oxygen concentration, and turbidity levels, is also considered to be a component of this definition. Examples of "waters" that may be considered EFH include open waters, wetlands, estuarine habitats, riverine habitats, and wetlands hydrologically connected to estuarine waters.
- "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, man-made structures underlying the waters, and associated biological communities. These communities could encompass mangroves, tidal marshes, mussel beds, cobble with attached fauna, mud and clay burrows, coral reefs, and submerged aquatic vegetation. Included in the interpretation of "substrate" are artificial reefs and shipwrecks (if providing EFH), and partially or entirely submerged structures such as jetties.
- Migratory routes, such as rivers and passes serving as passageways to and from spawning grounds and nursery areas, should also be considered EFH.

The NOAA Fisheries Service assists the Councils in implementing EFH programs by assessing the available data via a four-level system:

- 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 must 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, Public Law 104-208, 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 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 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 by such agency 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 Council, including information on environmental and habitat variables that control or limit distribution, abundance, reproduction, growth, survival, and productivity of the managed species.

The 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 Council's ecosystem approach to designating EFH and is consistent with NOAA Fisheries Service guidelines and broader goals for ecosystem management. The 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 FMP.

While remaining mindful of the above caveats, the Council has developed an Internet Map Server (IMS) for displaying EFH and EFH-HAPCs within the constraints of available data and technology. The IMS contains 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 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 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 Council will update the IMS to ensure the public has the best available spatial depictions of EFH descriptions. While the 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.

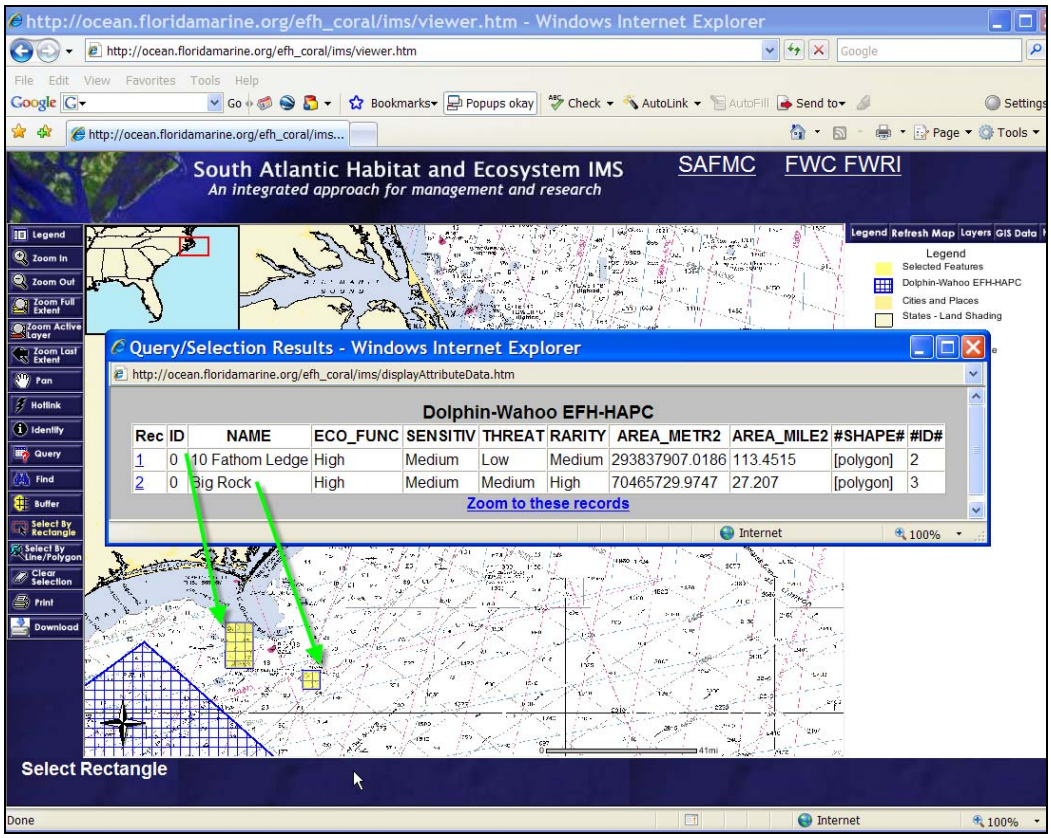

Figure 3-1. Sample screen shot of spatial presentation of EFH-HAPCs on South Atlantic Habitat and Ecosystem IMS.

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 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 Council to take include those described in CE-BA 1 (SAFMC 2009b) and this Amendment (CE-BA 2). NOAA Fisheries Service is in the process of providing a summary report highlighting these activities as part of its requirement to document and approve 5-year reviews. A few key elements of the review are summarized below.

The Fishery Ecosystem Plan (SAFMC 2009a) presents information on adverse effects from fishing and describes management measures the Council has implemented to minimize adverse effects on EFH from fishing. The conservation and enhancement measures implemented by the 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 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 Council has already

prevented, mitigated, or minimized most adverse effects from most fisheries prosecuted in the South Atlantic EEZ.

The 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 (CE-BA1) (SAFMC 2009b). The 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 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 Council as part of the annual Stock Assessment and Fishery Evaluation (SAFE) 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 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 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).

Four criteria are used to select candidate habitats or locations for EFH-HAPC designation:

1. Rarity (R)
2. Particular susceptibility to human-induced degradation (S)
3. Specially ecological importance (E)
4. Proximity to an environmentally stressed area (ES)

After careful consideration of the Fishery Ecosystem Plan (SAFMC 2009a) and input from the 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 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.

Establishing New EFH and EFH-HAPCs
The designation of these new EFH and EFH-HAPCs would not result in direct impacts to the region's fishery resources. Rather, EFH and EFH-HAPC designation under this action would provide an opportunity for the Council 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. Similarly, designation of EFH and EFH-HAPCs would require Federal agencies to consult with NOAA Fisheries Service and the Council on activities that may adversely affect that habitat.

3.4 Current EFH Designations

The Comprehensive EFH Amendment (SAFMC 1998b) and Dolphin/Wahoo FMP provide the Council's current EFH and EFH-HAPC designations. Since CE-BA 2 only proposes amending designations made under the Snapper Grouper FMP and Coral and Coral Reef 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 Council-designated Artificial Reef Special Management Zones (SMZs).

3.5 Administrative Environment

3.5.1 The Fishery Management Process and Applicable Laws

3.5.1.1 Federal Fishery Management

Federal fishery management is conducted under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) (16 U.S.C. 1801 et seq.), originally enacted in 1976 as the Fishery Conservation and Management Act. The Magnuson-Stevens Act claims sovereign rights and exclusive fishery management authority over most fishery resources within the U.S. 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 XX**. In most cases, the Secretary has delegated this authority to NOAA Fisheries Service.

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

Public interests also are involved in the fishery management process through participation on Advisory Panels and through council meetings, which, with few exceptions for discussing personnel matters, are open to the public. The Council uses a Scientific and Statistical Committee 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

ASFMC 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 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 exclusive economic zone (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 (K. Nedimeyer, personal communication). No large-scale harvest of octocorals for biomedical purposes is presently taking place in the South Atlantic EEZ (K. Nedimeyer, personal 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 (K. Nedimeyer, personal 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. 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.

The State of Florida 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 state of Florida 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 marine life 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.

Octocorals harvested under a federal fisheries permit must be reported to NOAA Fisheries Service.

Octocorals harvested by SAL holders must be reported to FWRI.

Octocorals harvested by recreational fishermen are not reported.

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 state of Florida, 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 standard self contained underwater breathing apparatus (SCUBA) gear, but a few use boat-mounted surface supplied air systems. Marine life vessels are required to have some sort of aeration system on board to aerate the livestock both on the water and during transport to an onshore holding facility.

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 collector to the final consumer. The traditional chain of possession of the product is collector 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 vs. 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 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 (K. Nedimeyer, pers. comm.).

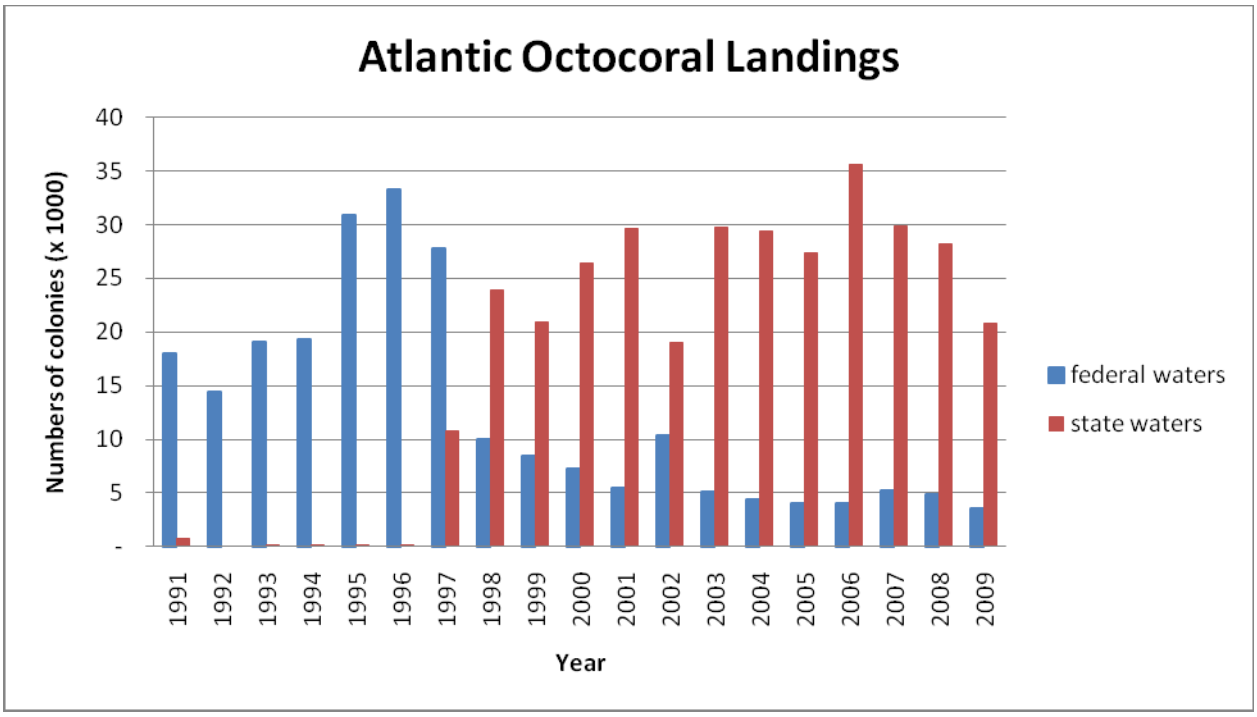

Figure 3-2. Octocoral harvest in South Atlantic Federal and state waters for the period 1991-2009 (Source: Florida Fish and Wildlife Research Institute).

Table 3-2. Octocoral harvest (in numbers of colonies) and 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 ($)
2000	Federal	7,278	15,135
2001	Federal	5,432	10,733
2002	Federal	10,407	26,829
2003	Federal	5,049	13,100
2004	Federal	4,386	11,901
2005	Federal	4,007	11,774
2006	Federal	4,024	11,408
2007	Federal	5,250	15,780
2008	Federal	4,890	15,734
2009	Federal	3,509	10,396
TOTAL		**54,232**	**142,790**
2000	State	26,355	70,142
2001	State	29,624	78,802
2002	State	18,968	43,642
2003	State	29,768	75,644
2004	State	29,339	78,317
2005	State	27,401	78,997
2006	State	35,589	107,726
2007	State	29,824	96,576
2008	State	28,230	99,256
2009	State	20,784	70,281
TOTAL		**275,882**	**799,383**

(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.

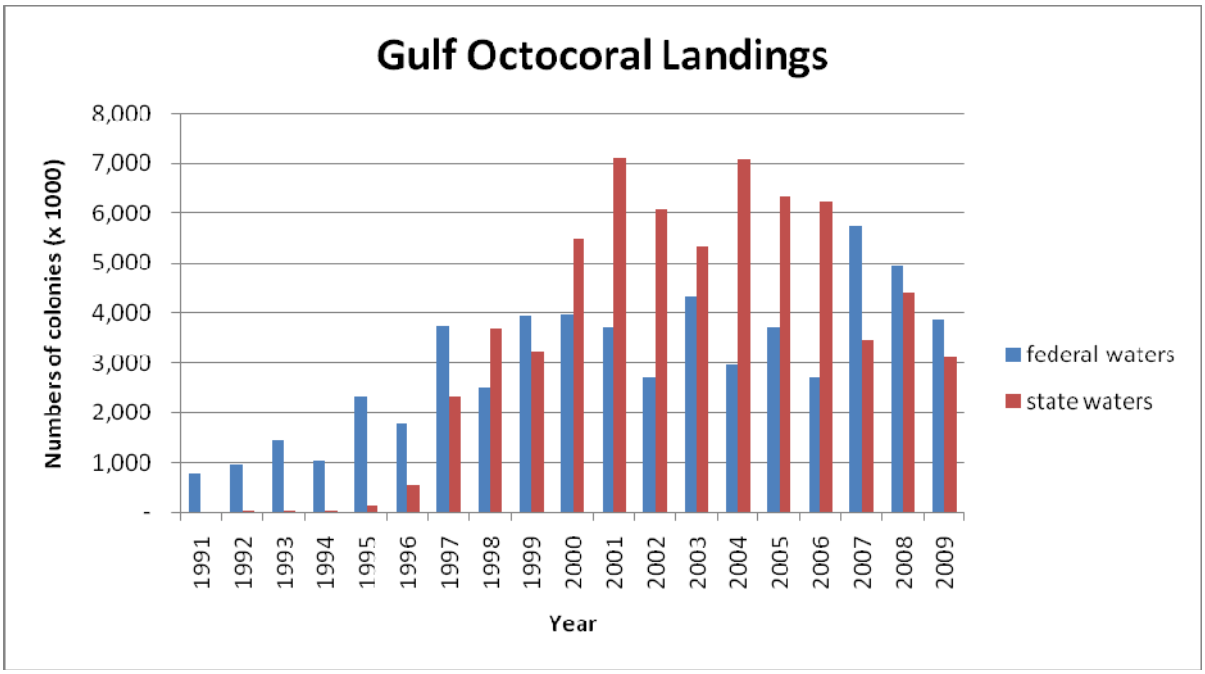

Figure 3-3. Octocoral harvest in Gulf of Mexico Federal and state waters for the period 1991-2009 (Source: Florida Fish and Wildlife Research Institute).

Table 3-3. Octocoral harvest (in numbers of colonies) and 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 ($)
2000	Federal	3,975	10,374
2001	Federal	3,728	7,502
2002	Federal	2,707	6,287
2003	Federal	4,331	12,810
2004	Federal	2,966	9,469
2005	Federal	3,693	14,125
2006	Federal	2,721	9,336
2007	Federal	5,747	21,547
2008	Federal	4,951	10,101
2009	Federal	3,863	15,504
TOTAL		**38,682**	**117,055**
2000	State	5,492	12,262
2001	State	7,110	22,267
2002	State	6,056	18,973
2003	State	5,336	15,564
2004	State	7,067	20,291
2005	State	6,351	14,620
2006	State	6,233	15,069
2007	State	3,451	11,854
2008	State	4,421	17,614
2009	State	3,103	13,235

Year	State/Fed	Numbers of colonies	Ex-vessel value ($)
TOTAL		**54,620**	**161,749**

(Source: Florida Fish and Wildlife Research Institute).

3.6.1.1.6 *Social and cultural environment*

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. 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.

Most fishermen that land octocorals also harvest other marine life specimens on the same trip and multiple species of octocorals usually can be harvested on the same dive. Octocoral communities are always associated with hardbottom habitats, and densities vary greatly. Harvest volume is governed by demand and by the amount of holding capacity available on the fishing vessel and at the shore-based holding facility.

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 South Carolina Special Management Zones

3.6.1.2.1 *Economic Description*

An estimate of trips and associated expenditures to SMZs off South Carolina is not available. However, an Economic Impact and Use Survey of South Carolina Artificial Reef Users (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) SC private boat fishing trips involving SC permitted marine artificial reef sites by SC licensees during 2006. The projected total number of SC 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 SC 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 SC offshore dive trips during 2006 with 53% of these charter divers (1,902 divers) making one or more dives on structures within SC permitted artificial reef sites.

The estimating of economic impacts and economic importance of anglers and charter divers related to the use of SC 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 SC coastal counties. The mean total daily trip expenditures by private boat anglers making a fishing trip to an SC artificial reef site during a sampled month ranged from $548 for non-coastal anglers staying overnight to about $255 for SC 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 SC marine artificial reef system, as developed and managed by the SCDNR, is a significant component of the entire SC coastal economy. In addition, the man-made structures within SC 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*

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 SC Department of Natural Resources) with assistance from Federal and private sector funding (Bell 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.

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. Even though some legitimate commercial trap fishermen utilized artificial reefs from time to time, it is more like that most of the trapping that took place on the reefs was a result of fishermen employing more efficient commercial-type gear to significantly improve their catches for personal consumption or under-the-table sales.

The use of efficient commercial fishing gear, and its potential and observed short- and long-term impacts on fish populations on the relatively small-scale artificial reefs became a point of concern among recreational anglers and their political representatives, as well as state fisheries biologists. The fear was that allowing a few individuals to remove a disproportionate share of the standing fish populations from artificial reefs through the use of commercial-type gear would negatively impact their overall success and intended purpose.

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 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.

4 Environmental Consequences

4.1 Action 1. Remove octocorals from the Fishery Management Unit (FMU) under the South Atlantic Coral FMP.

4.1.1 Biological Effects

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 or 50,000 colonies combined for the Gulf and South Atlantic EEZ. Octocorals are considered a data-poor stock; with no stock assessment and limited landings information. Fishery independent survey data indicate that there is a 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 Florida Fish and Wildlife Commission (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.

Alternative 2 would remove octocorals from the Coral FMP and would eliminate current management measures for octocorals in the South Atlantic. Under this alternative, octocorals would not be protected through a commercial quota, commercial permits, reporting requirements or a recreational bag limit in Federal waters. **Alternative 2** may result in a significant increase in the harvest or octocorals however, the market demand for the octocoral species is limited and would likely be the driving factor in an increase in effort.

Alternative 3 would remove octocorals from the FMU and delegate management of the fishery to the state of Florida. Currently, the SAFMC is responsible for management of the octocoral resource but the FWC is responsible for management, implementation and enforcement of the fishery. In state waters, Florida's management strategy for octocorals 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. Octocorals are defined in the FWC marine life rule as any erect, non-encrusting species of the Subclass Octocorallia, except for the common sea an and Venus sea fan. Harvest of these sea fans is prohibited in Florida waters.

There are no commercial bag 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. If octocorals are removed from the FMU, the 50,000 colony quota for the Gulf and South Atlantic EEZ will be eliminated. This could potentially lead to an increase in octocoral harvest in both state and Federal waters. **Alternative 3** would have minor negative impacts on the resource if the State of Florida did not implement a commercial quota for the species in state waters. Under **Alternative 3**, the harvest of octocorals in Federal waters will not be monitored or reported which may result in an increase in octocoral harvest. However, landings in Federal waters are low and are not expected to have a significant impact of the resource. **Alternative 3** would eliminate the possibility of Federal management for octocorals off of any other state in the South Atlantic if the need arises.

4.1.2 Economic Effects

4.1.3 Social Effects

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 once reached the fishery is closed in Federal waters. This quota and associated closure are the ACL and AM for the fishery. The quota has been implemented since XXXX and mechanisms for reporting, monitoring and enforcement have been established. **Alternative 1** is not expected to result in an increased administrative burden. **Alternative 2 and Alternative** 3 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 be result in a significant administrative burden.

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.

4.2.1 Biological Effects

Currently, the quota for octocorals is 50,000 colonies combined in the Gulf and South Atlantic EEZ. **Alternative 1 (No Action)** would continue this quota and would maintain the current biological impacts to the resource. **Alternative 2** would extend management jurisdiction of octocorals to include the Gulf of Mexico Fishery Management 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

biological impacts to the resource. **Alternative 1** and **Alternative 2** address jurisdictional issues but do not have an impact on harvest of the octocoral species and are expected to have similar biological impacts to the resource.

4.2.2 Economic Effects

4.2.3 Social Effects

4.2.4 Administrative Effects

The administrative impacts of Alternative 1 (No Action) would not change from the status quo. Under **Alternative 2**, the GMFMC must first remove octocorals from their Coral and Coral Reefs Fishery Management Plan and request the Secretary of Commerce to designate the SAMFC to manage octocorals throughout their range. The administrative impacts of **Alternative 2** would be increase slightly from those of **Alternative 1.**

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

4.3.1 Biological Effects

At their August 2010 meeting, the 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 and South Atlantic EEZ based on the unique characteristics of this fishery (2) the fact that the fishery is small and effort/participation in Florida waters is capped by a limited entry program, and (3) the fact that there are no signs of local depletion in areas where the fishery operates, or any other indication 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 and South Atlantic EEZ and state waters combined, annually. Based upon the landings history (see Table 3-2 & 3-3), and that federal and state waters have never closed, the SSC recommend the current quota is set at a value higher than what is historically landed. Per the landings, the 50,000 colony quota value is consistent if put into context of Gulf and South Atlantic EEZ and state waters, combined.

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 State of 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.

Table 4-1. Landings 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 Gulf and South Atlantic EEZ as well as landings in state waters. The majority of the octocoral harvest occurs in the State waters off of Florida. The landings off of the states in the Gulf and South Atlantic have not exceeded the 50,000 colony quota but have come fairly close to meeting that quota (Table 4-1). In November 2010, the SSC clarified that their ABC recommendation of 50,000 colonies annually includes Gulf and South Atlantic EEZ and state waters.

Table 4-2. Landings 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

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 more protection to the resource by considering state landings towards the quota.

Table 4-3. Landings 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

Neither Alternative 1 nor Alternative 2 is expected to have any impact on protected species in the area.

4.3.2 Economic Effects

4.3.3 Social Effects

4.3.4 Administrative Effects

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. The quota for the octocoral fishery was implemented in 1990 (Amendment 1 Coral FMP, GMFMC & SAFMC) 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.

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

4.4.1 Biological Effects

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 resource. However, there is little information on the amount of commercial harvest in the SMZs and any commercial effort is expected to be small.

4.4.2 Economic Effects

4.4.3 Social Effects

4.4.4 Administrative Effects

Under the no action alternative, the administrative impacts will not increase. Administrative impacts associated with the action alternatives are expected increase. Administrative impacts may take the form of preparation of regulations, education and outreach and law enforcement.

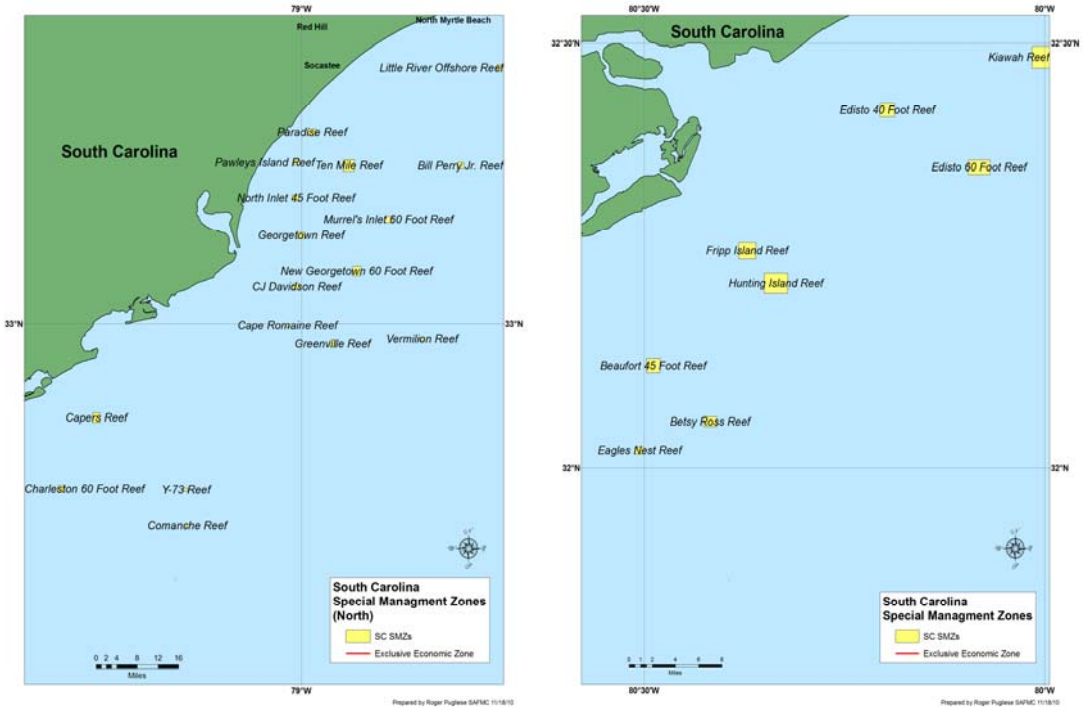

Figure 4-1. South Carolina Special Management Zones, North and South geographic areas.

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

4.5.1 Biological Effects

Current Amendment 15B sea turtle release gear requirements include the same dehooking and disentanglement gear required for the pelagic longline fishery despite the fact that many snapper grouper fishermen fish with much lighter rod and reel type fishing gear. For those using rod and reel, all dehooking and disentanglement gear required in the pelagic longline fishery may not be appropriate for use with the lighter tackle. The dehooking and disentanglement tools that would be included in this potential action are the line cutter which must be capable of cutting 2.0–2.1 mm (0.078 in -0.083 in) monofilament line (400–lb test) or polypropylene multistrand material known as braided or tarred mainline; bolt cutters, which must be able to cut hard metals, such as stainless or carbon steel hooks, up to 1/4–inch (6.35 mm) diameter; and dehookers built out of 5/16" stainless steel. These items were intended for use with pelagic longline tackle, and are therefore relatively "heavy duty." The effectiveness and necessity of these dehooking and disentanglement tools when used with lighter rod and reel tackle has been called into question. Therefore, the Council has been asked to consider developing an amendment action that would re-address and possibly modify sea turtle release gear requirements for the snapper-grouper fishery.

Alternative 1 (No Action) would maintain the current sea turtle 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

dehookers, line cutters, and bolt cutters specified under current regulations were designed for use with pelagic longline gear in compliance with a 2004 final rule that required sea turtle release gear for pelagic longline vessels in the Atlantic (69 FR 40734). 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 during the dehooking process. If this is the case, the biological impacts of **Alternative 1 (No Action)** could be negative. However, an argument could be made that requiring heavier-duty dehooking gear than is needed is better than not requiring any dehooking gear at all; and therefore, some biological benefit may still exist for sea turtles that are successfully released hook-free.

Alternative 2, is very general in that it would allow some type of modification of the gear specifications currently in the regulatory text of the codified federal regulations and does not specify what modifications could be made or to what magnitude. However, **Alternative 2** does specify the gear for which the specifications could be changed including, bolt cutters, and dehookers. If the gear specifications for these two pieces of sea turtle dehooking tools are modified to be tailored for use with rod and reel, troll, handline, and bandit gear, it could make it easier for fishermen using those types of hook-and-line gear to release hooked sea turtles with minimum harm, which would be biologically beneficial. However, it may not be biologically advantageous to change the current gear specifications for fishermen using bottom longline gear to fish for snapper grouper species because bottom longline gear uses similar tackle weights and strengths as pelagic longline fishermen, for whom it is necessary to carry heavier gauge sea turtle dehooking tools.

Alternative 3 is similar to **Alternative 2** because it would also modify the sea turtle dehooking gear specifications; however, it would not limit those modifications to only dehookers and bolt cutters. It would allow modifications to be made to any all types of dehooking and disentanglement gear specifications, and simply require gear of an "appropriate size and strength", rather than specifying specific materials of which the required gear must be constructed. The same items would be required on board every federally-permitted snapper grouper vessel with hook-and-ling gear onboard, but the vessel owner/operator could use their discretion as to what size and materials are most appropriate for use with the specific type of fishing tacking onboard. It is difficult to predict what biological impact **Alternative 3** could have since the appropriateness of certain sea turtle release gear would be highly subjective. If some fishermen underestimate the size and materials needed for an appropriate dehooking or disentanglement tool, they could risk serious injury or even death of hooked or entangled sea turtles. Because the "appropriateness" of sea turtle release gear is so subjective, and there would be no standard release gear specifications, enforcement of this provision could be very difficult in the fishery. Enforcement in the Florida Keys area would be especially difficult, since the Gulf has different regulations for sea turtle release gear requirements.

Alternatives 4 and **5** address the concerns raised under **Alternative 2** regarding the need to modify turtle release gear specifications for vessels carrying only rod and reel type gear while maintaining the current turtle release gear specifications for vessels using bottom

longline gear. Under **Alternative 4** the only tools identified for vessels carrying hook-and-line gear with no longline fishing gear gear aboard are 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. Similar to **Alternative 3**, the dehooking and line cutting capabilities of any tool onboard a vessel are subjective, and would therefore be difficult to enforce. Additionally, potential biological effects are difficult to predict under **Alternative 4** because effectiveness of only certain sea turtle release tools has been tested. However, if the sea turtle release guidelines are followed, and hooks or entangling line are safely removed there would likely be a biological benefit. The requirement to have some unspecified tools onboard that are capable of ridding a turtle 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 injury inflicted on a turtle from use of inappropriate release gear could be avoided.

Alternative 5 differs from **Alternative 4** by identifying specific types of sea turtle release gear for snapper grouper vessels carrying hook-and-line gear other than longlines onboard. This alternative requires no interpretation of "appropriateness" since specific tools are listed as required sea turtle release gear. **Alternative 5** 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 effectively release sea turtles that become hooked or entangled in fishing gear. **Alternative 5** may have a slightly greater positive biological impact than **Alternative 4** since the risk of fishermen not having adequate gear onboard to safely release a hooked or entangled sea turtle would be minimized through the specification of required tools.

Alternative 6 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. **Alternative 6** also offers the option of tailoring sea turtle release gear specifications to increase effectiveness when used with lighter tackle in the snapper grouper fishery. The **Sub-Alternatives 6a** and **6b** would either allow for gear specifications to be changed for only vessels with freeboard heights less than four feet, or for all snapper grouper vessels regardless of freeboard height.

4.5.2 Economic Effects

4.5.3 Social Effects

4.5.4 Administrative Effects

~~**Action 6. Amend the Shrimp Fishery Management Plan (FMP) to designate new Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs).**~~
~~**Alternative 1. No action.** Do not amend the Shrimp FMP to designate new Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs).~~

~~**Alternative 2.** Amend the Shrimp FMP to designate the new Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs):~~

~~**Sub-Alternative 2a.** Bulls Bay, South Carolina (for penaeid shrimp)~~

~~**Sub-Alternative 2b 2a.** Ashepoo, Combahee and Edisto (ACE) Basin, South Carolina (for penaeid shrimp)~~

**Habitat Conservation Division staff and Council staff recommend removal of this action. They suggest the EFH designation is not needed for these areas.

4.5.5 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 EFH-HAPCs.

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 ~~soft bottom substrate comprised of mud, sand, or clay; burrows found in soft bottom~~; irregular bottom comprised of troughs and terraces inter-mingled with sand, mud, or shell hash bottom. Mud-clay bottoms in depths of 150-225 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.

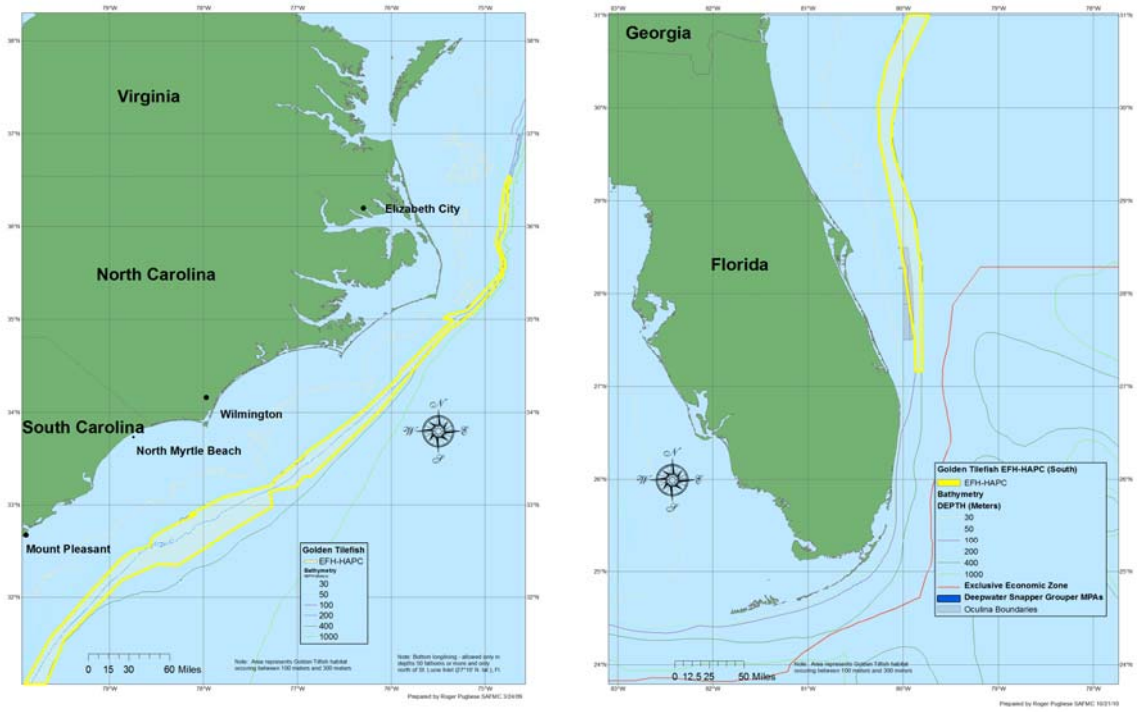

Figure 4-2. Proposed Golden Tilefish Essential Fish Habitat.

Alternative 3. Designate EFH-HAPCs for the snapper-grouper complex to include Deepwater Marine Protected Areas (MPAs).

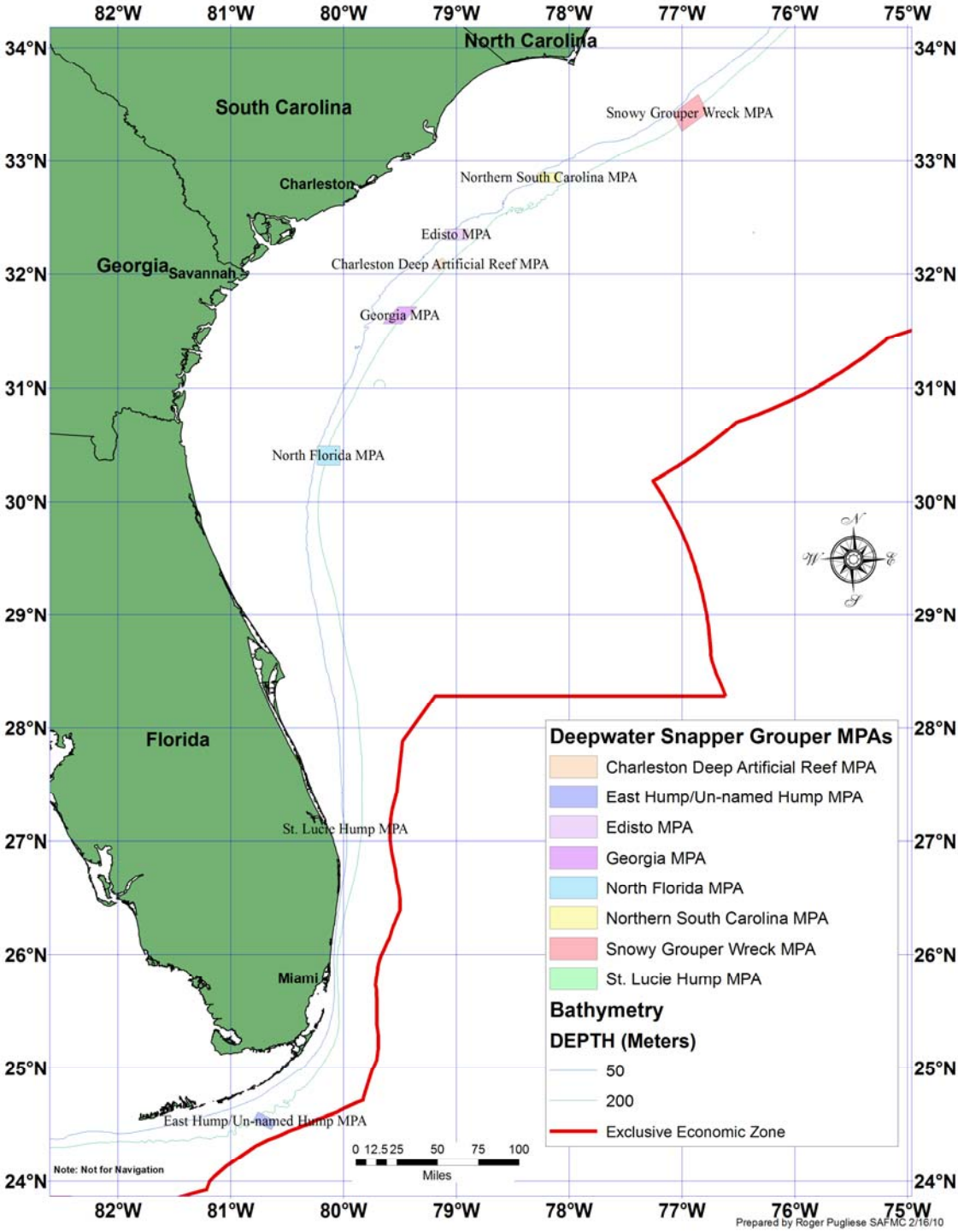

Figure 4-3. Deepwater Snapper Grouper Marine Protected Areas.

Table 4-4. 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

4.5.5.1 Biological Effects

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 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-HAPC would require Federal agencies to consult with NMFS on activities which may adversely affect that habitat.

4.5.5.2 Economic Effects

Designation of additional EFH-HAPCs will require the 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.

4.5.5.3 Social Effects

There will be few social impacts from establishing EFH-HAPCs. The social impacts will most likely come from future actions that are associated with such designations. In some cases, protection of habitat may mean harvesting restrictions in areas where harvesting presently takes place or other actions which may impose similar constraints on penaeid shrimp fishermen or processors. This could conceivably impose negative short-term impacts.

It is worth noting that the designation of essential fish habitat will alter the process by which permits for activities which impact essential fish habitat 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.

4.5.5.4 Administrative Effects

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. 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.

~~Action 8. Amend the Coastal Migratory Pelagics Fishery Management Plan (FMP) to designate new Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs).~~

~~Managed jointly with the Gulf of Mexico Fishery Management Council, the Coastal Migratory Pelagics fishery includes king mackerel (*Scomberomorus cavalla*), Spanish mackerel (*Scomberomorus maculatus*), cero mackerel (*Scomberomorus regalis*), cobia (*Rachycentron canadum*), and little tunny (*Euthynnus alletteratus*). A more detailed description of the biology and habitat utilization of species in the coastal migratory pelagic fishery is included in Volume II of the FEP.~~

~~**Alternative 1. No action.** Do not amend the Coastal Migratory Pelagics FMP to designate new Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs).~~

~~**Alternative 2.** Amend the Coastal Migratory Pelagics FMP to designate new Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs):~~

~~**Sub-Alternative 2a.** Ashepoo, Combahee and Edisto (ACE) Basin, SC~~

**Habitat Conservation Division staff and Council staff recommend removal of this action. They suggest the EFH designation is not needed for these areas.

4.5.6 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). The following existing designations would remain in effect.

Alternative 2. Amend the Coral FMP to designate Deepwater Coral HAPCs as EFH-HAPCs.

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. 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 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 - 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.

Savannah and East Florida Lithoherms - This 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 Pourtales 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 Pourtales 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 Snapper Grouper Amendment 14, East Hump/Un-named Hump MPA, is located within the Pourtales 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 4-5.**

Table 4-5. 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

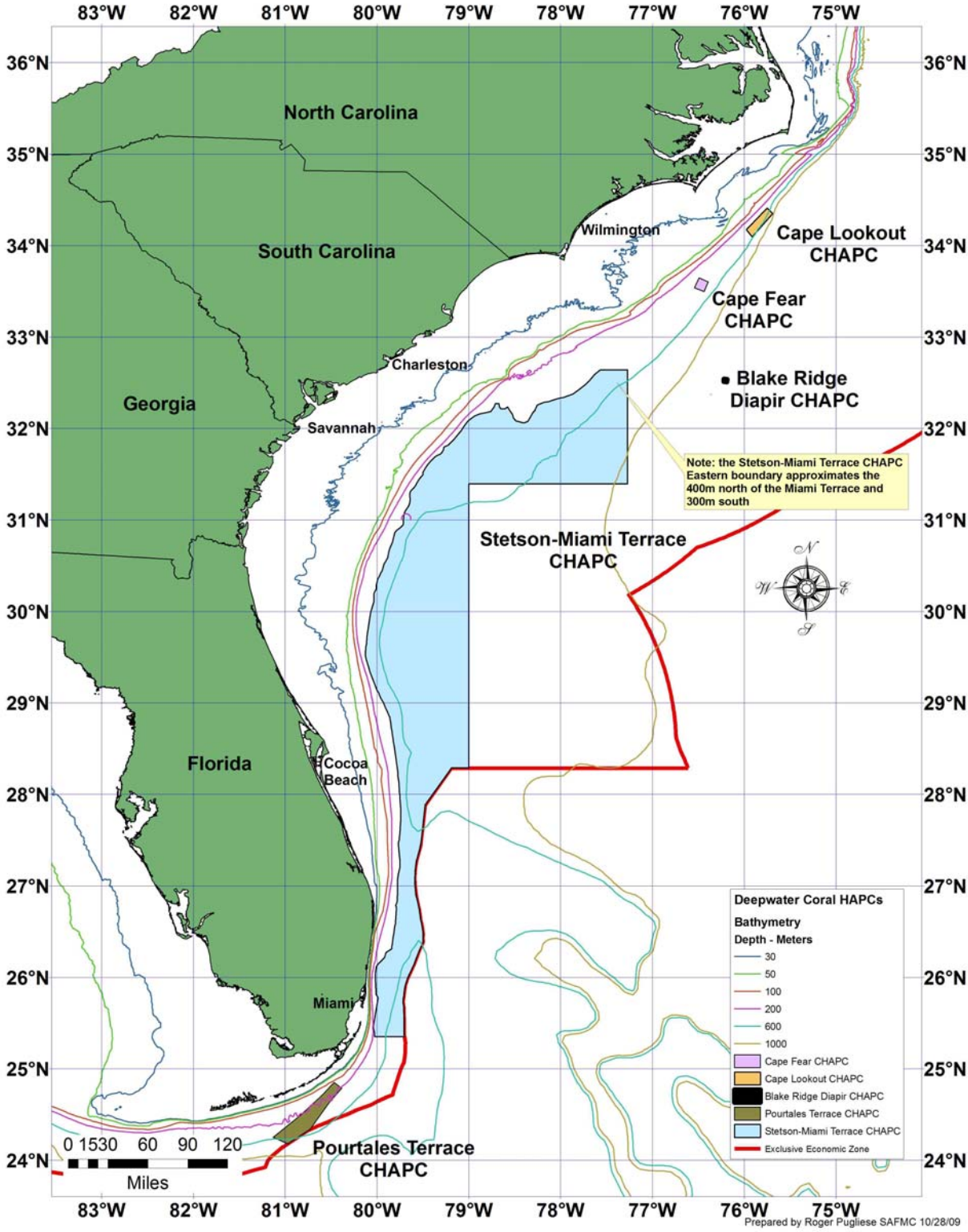

Figure 4.4. Deepwater Coral Habitat Areas of Particular Concern (SAFMC 2009a).

4.5.6.1 Biological Effects

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 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. Similarly, designation of additional coral EFH-HAPCs would require Federal agencies to consult with NMFS on activities which may adversely affect that habitat.

4.5.6.2 Economic Effects

Designation of EFH-HAPC will require the 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.

4.5.6.3 Social Effects

There will be few social impacts from establishing EFH-HAPCs. The social impacts will most likely come from future actions that are associated with such designations.

It is worth noting that the designation of essential fish habitat will alter the process by which permits for activities which impact essential fish habitat 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.

4.5.6.4 Administrative Effects

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. 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.

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

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

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*.

Limiting the EFH identification to the upper 10 meters of the surface as bounded by the Gulf Stream was recommended by NMFS in the development of the FEIS (NMFS 2002) for the Pelagic *Sargassum* Habitat FMP. This area is the upper 10 meters of the surface of the area shown in Figure 4-5.

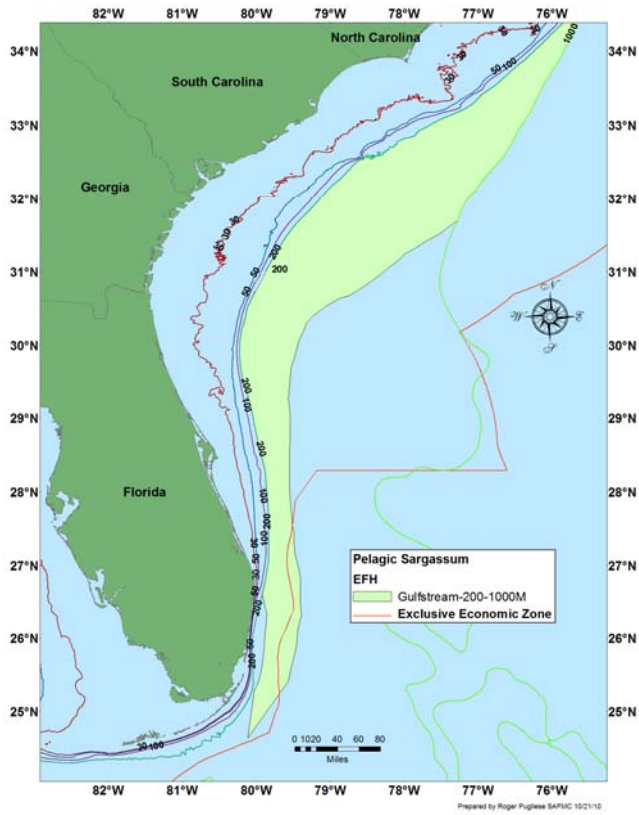

Figure 4-5. Proposed EFH for Pelagic Sargassum**.**

4.5.7.1 Biological Effects

The action alternatives 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 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 NMFS on activities which may adversely affect that habitat.

The identification of essential habitat for pelagic Sargassum enables the Council to protect essential fish habitat 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 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 only would encompass the uppermost 10 m of the marine water column.

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 man's activities which could cause or lead to the degradation of *Sargassum* EFH.

Implementation of Sub-Alternative 2a would provide an additional resource concern by which the Council could intercede in Federal actions to further the conservation of EFH and dependent Federally-managed fisheries. Currently, areas considered for designation as EFH for pelagic *Sargassum* already have been specified as EFH for one or more of the various Council and NMFS managed fisheries: shrimp, snapper grouper, dolphin and wahoo, coastal migratory pelagics, and highly migratory species.

4.5.7.2 Economic Effects

The identification of EFH is a mandated requirement of an FMP. Therefore, this option would not allow the full implementation of the Sargassum FMP and establishment of a platform for future management actions. Also, the 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 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 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.

4.5.7.3 Social Effects

The no action alternative would not meet Magnuson-Stevens mandates to identify essential fish habitat. Although there would be few social impacts from no action, it is in the best interest of the Council and fishermen to identify this habitat. Designation of essential pelagic Sargassum habitat can facilitate expeditious Council action in the future to protect habitat.

There would be few social impacts from identifing EFH for pelagic *Sargassum*. The social impacts would most likely come from the actions that were associated with such a designation. The assumption would be that such designation would provide protection for habitat. In that case, the social impacts would be positive in the long-term. However, in some cases, protection of habitat may mean harvesting restrictions in areas where harvesting presently takes place or other actions which may impose constraints on those who harvest habitat. This would certainly impose negative short-term impacts that may be mitigated in the long term if productivity is increased.

4.5.7.4 Administrative Effects

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. 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.

4.5.8 Action 9. Amend the Fishery Management Plan (FMP) for Pelagic *Sargassum* Habitat to designate EFH-HAPCs

Alternative 1. No action. Do not designate EFH-HAPCs for Pelagic Sargassum.

Alternative 2. Amend the *Sargassum* FMP to designate one or more of the following as EFH-HAPCs

Sub-Alternative 2a. The Charleston Bump Complex

The quasi-permanent gyres impinge upon the shelf near the "Charleston Bump" with this habitat complex serving as important spawning/larval retention habitat for a variety of fishes (Collins and Stender, 1987; Lee et al., 1994). The region known as "The Point" off Cape Hatteras (Figure 4-7) supports an unusually high biomass of upper trophic level predators, including many important pelagic fishes. It has been suggested that the area is the most productive sport fishery on the east coast (Ross, 1989).

Due to their important ecological function, at least two offshore pelagic environments, the "Charleston Bump" and "The Point", discussed above were designated essential fish habitat-habitat areas of particular concern (EFH-HAPCs) for coastal migratory pelagics, snapper grouper species, and coral and live/hard bottom habitat (SAFMC, 1998a,b). Both regions are productive and highly dynamic oceanic areas where pelagic *Sargassum* is concentrated. This was noted in the SAFMC essential fish habitat workshop on pelagic habitat. A quasi-permanent, cyclonic eddy with attendant upwelling of nutrient-rich deep water sets-up in the wake of the Charleston Bump. Upwelling results in persistent primary and secondary production that may well result in an important, if not essential feeding environment for the larvae of fishes that congregate to spawn there. The hydrodynamics of the eddy may well serve in the retention of fish propagules that are lost from local populations elsewhere through entrainment into the Gulf Stream. "The Point" off Cape Hatteras is also highly productive due to the confluence of as many as four water masses. Adults of highly migratory species congregate in this area, while the diversity of larval fishes found there is high (SAFMC 2002).

The Charleston Bump (Figure 4-6) is a bottom feature of great topographic relief located southeast of Charleston South Carolina (Sedberry et al., 2000) The Bump complex includes a quasi-permanent, cyclonic eddy the "Charleston Gyre" with attendant upwelling of nutrient-rich deep water sets-up in the wake of the "Charleston Bump". Upwelling results in persistent primary and secondary production that results in an important, if not essential feeding environment for larvae of fishes and the adults that congregate to spawn there. The hydrodynamics of the eddy, thermal fronts associated with the Gulf Stream and the benthic

habitat contribute to attract pelagic fish and retain and concentrate larvae, juvenile, prey for larger fish (Sedberry et al., 2000) and pelagic *Sargassum*. Therefore this area is an EFH-HAPC for all life pelagic *Sargassum*.

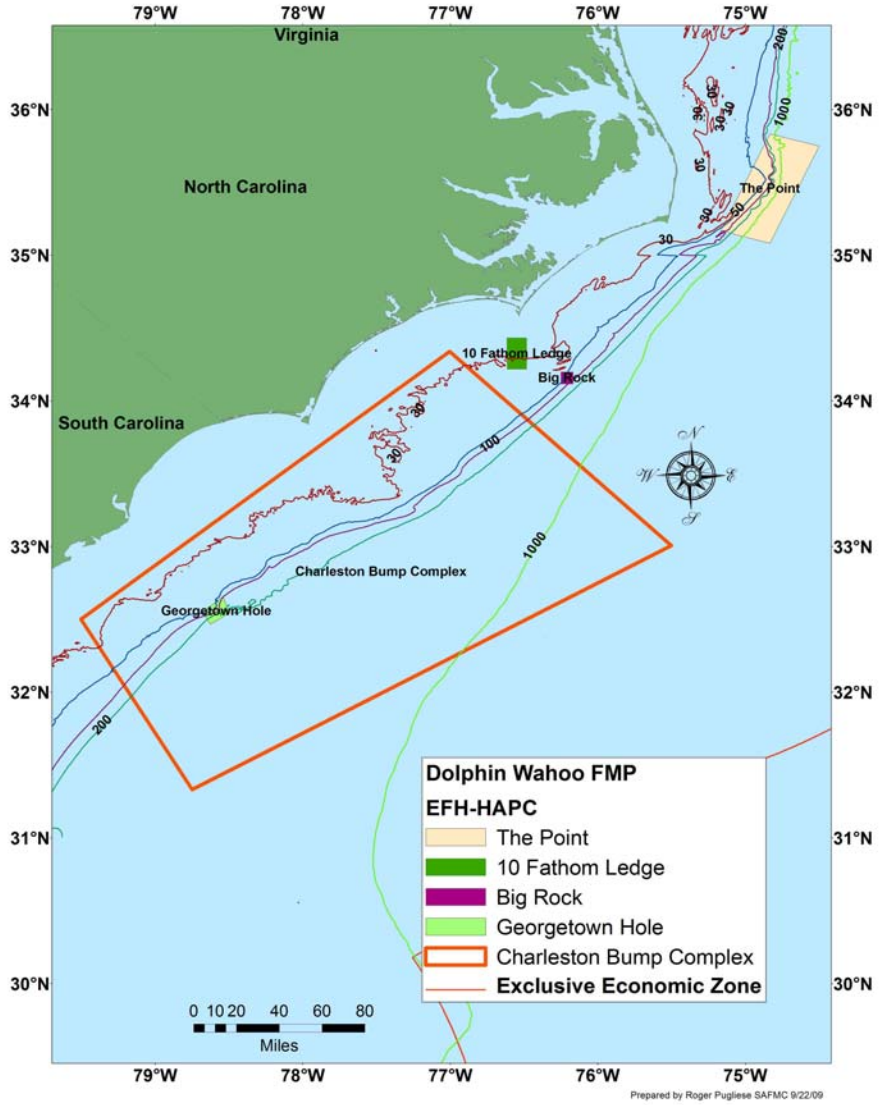

Figure 4-6. "The Charleston Bump Complex" and "The Point" Essential Fish Habitat-Habitat Areas of Particular Concern (Source: Dolphin Wahoo FMP SAFMC 2002).

Sub-Alternative 2b. The Point, NC.

"The Point" off Cape Hatteras (Figure 4-7) is also highly productive due to the confluence of as many as four water masses. Adults of highly migratory species congregate in this area, while the diversity of larval fishes found there is truly astounding (Table 18b of the Habitat Plan (SAFMC, 1998b).

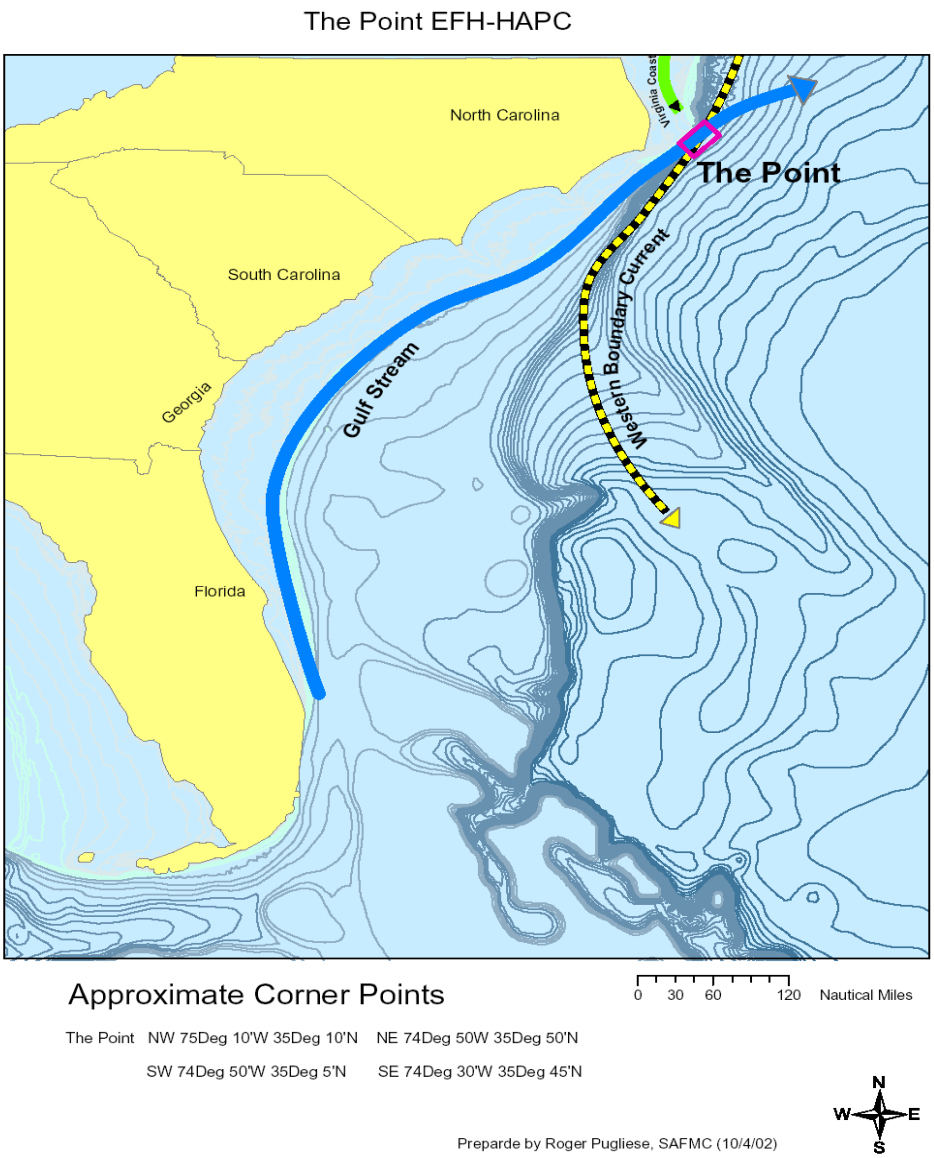

Figure 4-7. "The Point" Essential Fish Habitat-Habitat Area of Particular Concern (Source: Dolphin Wahoo FMP SAFMC 2002).

4.5.8.1 Biological Effects

The designation of an EFH-HAPC for pelagic *Sargassum* 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 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-HAPC would require Federal agencies to consult with NMFS on activities which may adversely affect that habitat.

4.5.8.2 Economic Effects

Designation of EFH-HAPC will require the 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.

4.5.8.3 Social Effects

There will be few social impacts from establishing EFH-HAPCs. The social impacts will most likely come from future actions that are associated with such designations. In some cases, protection of habitat may mean harvesting restrictions in areas where harvesting presently takes place or other actions which may impose similar constraints on pelagic Sargassum fishermen or processors. This could conceivably impose negative short-term impacts.

It is worth noting that the designation of essential fish habitat will alter the process by which permits for activities which impact essential fish habitat 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.

4.5.8.4 Administrative Effects

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. 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.

4.5.9 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 Council on Environmental Quality (CEQ) offers guidance on conducting a Cumulative Effects Analysis (CEA) in a report titled "Considering Cumulative Effects under the National Environmental Policy Act" (CEQ 1997). The report outlines 11 items for consideration in drafting a CEA for a proposed action.

1. Identify the significant cumulative effects issues associated with the proposed action and define the assessment goals.
2. Establish the geographic scope of the analysis.
3. Establish the timeframe for the analysis.
4. Identify the other actions affecting the resources, ecosystems, and human communities of concern.
5. Characterize the resources, ecosystem, and human communities identified in scoping in terms of their response to change and capacity to withstand stresses.
6. Characterize the stresses affecting these resources, ecosystems, and human communities and their relation to regulatory thresholds.
7. Define a baseline condition for the resources, ecosystems, and human communities.
8. Identify the important cause-and-effect relationships between human activities and resources, ecosystems, and human communities.
9. Determine the magnitude and significance of cumulative effects.
10. Modify or add alternatives to avoid, minimize, or mitigate significant cumulative effects.
11. Monitor the cumulative effects of the selected alternative and adapt management.

4.5.10 Biological

SCOPING FOR CUMULATIVE EFFECTS

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

The CEQ cumulative effects guidance states that this step is done through three activities. The three activities and the location in the document are as follows:

I. The direct and indirect effects of the proposed action (**Section 4.0**);

II. Which resources, ecosystems, and human communities are affected (**Section 3.0**).
III. Which effects are important if from a cumulative effects perspective (information contained in this CEA).

2. Establish the geographic scope of the analysis.

The immediate impact area would be the federal 200-nautical mile limit of the Atlantic off the coasts of North Carolina, South Carolina, Georgia, and east Florida to Key West; specifically, deepwater coral ecosystems identified in **Section 3.0**.

3. Establish the timeframe for the analysis.

4. Identify the other actions affecting the resources, ecosystems, and human communities of concern

The cumulative effects to the human communities are discussed in **Section 4.0.**
Listed are other past, present, and reasonably foreseeable actions occurring in the South Atlantic region. These actions, when added to the proposed management measures, may result in cumulative effects on the biophysical environment.

I. Fishery-related actions affecting South Atlantic deepwater coral, shrimp, and golden crab.

A. Past

Coral reefs and live hard bottom habitat have been managed since 1982 (GMFMC & SAFMC 1982). Through several amendments to the original FMP, an octocoral quota was implemented, defined OY for corals and sea fans, implemented live rock harvest prohibitions in certain areas, allowed for the aquaculture of live rock in the EEZ, and established the Oculina HAPC.

B. Present

In this amendment the Council has recommended:

B. Reasonably Foreseeable Future

A Comprehensive ACL Amendment will be under development during 2010 to implement ACLs, Annual Catch Targets (ACTs) and Accountability Measures (AMs) for all species managed by the South Atlantic Council.

II. Non-Council and other non-fishery related actions, including natural events affecting

A. Past
B. Present
C. Reasonably foreseeable future

AFFECTED ENVIRONMENT

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

This step should identify the trends, existing conditions, and the ability to withstand stresses of the environmental components.

6. **Characterize the stresses affecting these resources, ecosystems, and human communities and their relation to regulatory thresholds.**

Coral

Quantitative definitions of OY and live rock and allowable octocoral are identified in the Joint Coral FMP (GMFMC & SAFMC 1982) and Amendment 1 (GMFMC & SAFMC 1990), Amendment 2 (GMFMC & SAFMC 1994), and Amendment 5 (SAFMC 1998c).

Maximum Sustainable Yield

Coral Amendment 5 (SAFMC 1998c) states an estimated MSY has been determined for several species at specific reefs in the Florida reef tract, but cannot be expanded to other corals due to great differences in species, density, growth rates, and other factors. An approximation to MSY was calculated for several communities. One option considered for MSY in Amendment 5 was: MSY is equal to 30%-40% static SPR; however, the Council rejected this range because the level of data was poor.

Optimum Yield

Coral Amendment 5 (SAFMC 1998c) holds that in Amendment 2 (GMFMC & SAFMC 1994), for live rock: OY is to be 485,000 lbs annually for the South Atlantic Region where harvest is allowed during 1994 and 1995, after which it is to be zero. Therefore, currently, OY is equal to zero accept as may be authorized for scientific and educational purposes and under live rock aquaculture permits.

Overfished and Overfishing Definitions

Currently there is no specific definition of an overfished condition for coral species in the South Atlantic; however, Coral Amendment 5 (SAFMC 1998c) defines overfishing as an annual harvest that exceeds OY.

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

The purpose of defining a baseline condition for the resource and ecosystems in the area of the proposed action is to establish a point of reference for evaluating the extent and significance of expected cumulative effects.

DETERMINING THE ENVIRONMENTAL CONSEQUENCES OF CUMULATIVE EFFECTS

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

9. Determine the magnitude and significance of cumulative effects.

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

11. Monitor the cumulative effects of the selected alternative and adapt management.

4.5.10.1 Effects on protected species

4.5.11 Socioeconomic

4.5.12 Administrative

4.6 Unavoidable Adverse Effects

4.7 Effects of the Fishery on the Environment

4.7.1 Effects on Ocean and Coastal Habitats

4.7.2 Public Health and Safety

4.7.3 Endangered Species and Marine Mammals

4.8 Relationship of Short-Term Uses and Long-Term Productivity

4.9 Irreversible and Irretrievable Commitments of Resources

4.10 Monitoring and Mitigation Measures

5 List of Preparers

Name	Title	Agency	Location
Anna Martin	Fishery Scientist CE-BA 2 Coordinator SAFMC Lead	SAFMC	SAFMC
Karla Gore	Fishery Biologist NMFS Co-Lead	NMFS SERO	NMFS SERO
Roger Pugliese	Senior Fishery Biologist	SAFMC	SAFMC
Kate Quigley	Economist	SAFMC	SAFMC
Kate Michie	Fishery Biologist	NMFS SERO	NMFS SERO
Gregg Waugh	Deputy Director	SAFMC	SAFMC
Carlos Rivero	Physical Scientist	NMFS SEFSC	NMFS SEFSC

Interagency CE-BA 2 Planning Team/Reviewers

Name	Title	Agency	Location
Anna Martin	Fishery Scientist CE-BA 2 Coordinator SAFMC Lead	SAFMC	SAFMC
Karla Gore	Fishery Biologist NMFS Co-Lead	NMFS SERO	NMFS SERO
Roger Pugliese	Senior Fishery Biologist	SAFMC	SAFMC
Kate Michie	Fishery Biologist	NMFS SERO	NMFS SERO
Kate Quigley	Economist	SAFMC	SAFMC
Monica Smit-Brunello	Attorney Advisor General	NOAA	SERO
David Keys	Regional NEPA Coordinator	NOAA	SERO
Gregg Waugh	Deputy Director	SAFMC	SAFMC
Janet Miller	Program Specialist	NMFS SERO	NMFS SERO
Denise Johnson	Industry Economist	NMFS SERO	NMFS SERO
Andrew Herndon	Fishery Biologist	NMFS SERO	NMFS SERO
Jack McGovern	Fishery Biologist	NMFS SERO	NMFS SERO
David Dale	NEPA/EFH Specialist	NMFS SERO	NMFS SERO
Pace Wilber	Atlantic Branch Supervisor, Fishery Biologist	NMFS SERO	NMFS SERO
Tom Jamir	Fishery Biologist	NMFS	NMFS

		SEFSC	SEFSC
Carlos Rivero	Physical Scientist	NMFS SEFSC	NMFS SEFSC
Joan Browder	Research Fishery Biologist	NMFS SEFSC	NMFS SEFSC
Michael Burton	Research Fishery Biologist	NMFS SEFSC	NMFS SEFSC
Tracy Dunn	Supervisory Criminal Investigator	NMFS OLE	NMFS SERO
Brad McHale	Fishery Management Specialist	NMFS HMS	NMFS HMS
Chris Rilling	Supervisory Fish Management Officer	NMFS HMS	NMFS HMS

6 List of Agencies, Organizations, and Persons to Whom Copies of the Statement are Sent

Responsible Agency

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

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

List of Agencies, Organizations, and Persons Consulted

SAFMC 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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