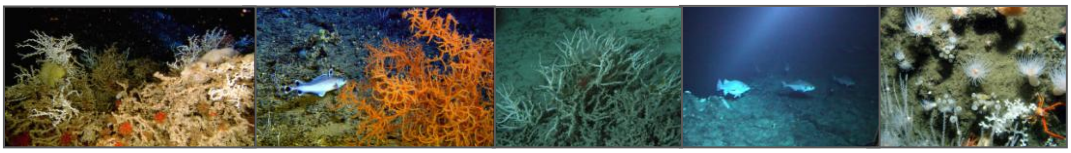
COMPREHENSIVE ECOSYSTEM-BASED AMENDMENT 2 FOR THE SOUTH ATLANTIC REGION



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ABBREVIATIONS AND ACRONYMS

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

MARMAP	Marine Resources Monitoring Assessment and Prediction Program
MARFIN	Marine Fisheries Initiative
MBTA	Migratory Bird Treaty Act
MFMT	Maximum Fishing Mortality Threshold
MMPA	Marine Mammal Protection Act of 1973
MRFSS	Marine Recreational Fisheries Statistics Survey
MSA	Magnuson-Stevens Act
MSST	Minimum Stock Size Threshold
MSY	Maximum Sustainable Yield
NEPA	National Environmental Policy Act of 1969
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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February 5, 2009 (Pooler, GA)

ABSTRACT

This Comprehensive Ecosystem-Based Amendment 2 (CE-BA 2) consists of

Management actions proposed in the CE-BA 2 include

Actions in this Comprehensive Ecosystem-Based Amendment 2 would:

TABLE OF CONTENTS

ABBREVIATIONS AND ACRONYMS i
ABSTRACT iv
TABLE OF CONTENTS v
LIST OF TABLES x
LIST OF FIGURES xi
LIST OF APPENDICES xii
TABLE OF CONTENTS FOR THE ENVIRONMENTAL ASSESSMENT xiii
SUMMARY xiv
1 Introduction 1-1
1.1 Purpose and Need 1-1
1.2 Management Objectives 1-2
1.3 History of Management 1-3
2 Actions and Alternatives 2-1
2.1 Action 1. 1. Establish Maximum Sustainable Yield (MSY) for octocorals in the South Atlantic. 2-1
2.1.1 Comparison of Alternatives 2-1
2.1.2 Conclusion 2-2
2.2 Action 2. Establish an Overfishing Level (OFL) for octocorals in the South Atlantic 2-2
2.2.1 Comparison of Alternatives 2-2
2.2.2 Conclusion 2-2
2.3 Action 3. Establish Acceptable Biological Catch (ABC) for octocorals in the South Atlantic 2-2
2.3.1 Comparison of Alternatives 2-3
2.3.2 Conclusion 2-3
2.4 Action 4. Establish an Allowable Catch Limit (ACL) for octocorals in the South Atlantic 2-3
2.4.1 Comparison of Alternatives 2-3
2.4.2 Conclusion 2-4
2.5 Action 5. Establish Accountability Measures (AMs) for octocorals in the South Atlantic 2-4
2.5.1 Comparison of Alternatives 2-4
2.5.2 Conclusion 2-4
2.6 Action 6. Modify the existing Live Rock Aquaculture program to allow harvest of octocorals 2-5
2.6.1 Comparison of Alternatives 2-5
2.6.2 Conclusion 2-5
2.7 Action 7. Transfer management authority of the octocoral fishery to the State of Florida 2-5
2.7.1 Comparison of Alternatives 2-6
2.7.2 Conclusion 2-6
2.8 Action 8. Allow harvest of the exotic stony coral Tubastrea coccinea 2-6
2.8.1 Comparison of Alternatives 2-6
2.8.2 Conclusion 2-6

2.9 Action 9. Amend Council FMPs as needed to designate new or modify existing EFH and EFH-HAPCs. 2-6
2.9.1 Comparison of Alternatives 2-7
2.9.2 Conclusion 2-7
2.10 Action 10. Require that all harvest with the use of all non-prohibited fishing gear in Special Management Zones in South Carolina be limited to the recreational bag limit. 2-7
2.10.1 Comparison of Alternatives 2-7
2.10.2 Conclusion 2-7
3 Affected Environment 3-1
3.1 Habitat 3-1
3.1.1 Description and distribution 3-1
3.1.2 Octocorals as Essential Fish Habitat 3-4
3.2 Biological/Ecological Environment 3-5
3.2.1 Species Most Impacted by this Amendment 3-5
3.2.1.1 Octocorals 3-5
3.2.1.2 Snapper Grouper Complex 3-11
3.2.2 Other Affected Species 3-12
3.2.3 Endangered Species Act (ESA)-Listed Species 3-12
3.3 Administrative Environment 3-18
3.3.1 The Fishery Management Process and Applicable Laws 3-18
3.3.1.1 Federal Fishery Management 3-18
3.3.1.2 State Fishery Management 3-19
3.3.2 Enforcement 3-19
3.4 Human Environment 3-20
3.4.1 Description of the Fisheries 3-20
3.4.1.1 Octocoral Fishery Description 3-20
3.4.1.1.1 History of the Commercial Fishery 3-20
3.4.1.1.2 Licenses and Permits 3-21
3.4.1.1.3 Reporting requirements 3-21
3.4.1.1.4 Harvest Methods 3-22
3.4.1.1.5 Economic description 3-23
3.4.1.1.6 Social and cultural environment 3-26
3.4.1.1.7 Bycatch 3-27
3.4.1.2 Live Rock Aquaculture 3-27
3.4.1.2.1 Economic description 3-29
3.4.1.2.2 Social and cultural environment 3-30
3.4.1.2.3 Bycatch 3-31
3.4.1.3 South Carolina Special Management Zones 3-31
3.4.1.3.1 Economic Description 3-31
3.4.1.3.2 Social and Cultural Environment 3-32
4 Environmental Consequences 4-34
4.1 Essential Fish Habitat and Essential 4-34
4.2 Fish Habitat Areas of Particular Concern 4-34
4.2.1 Penaeid and deepwater shrimp 4-40
4.2.1.1 Essential Fish Habitat 4-40

4.2.1.2 Essential Fish Habitat-Habitat Areas of Particular Concern..... 4-40
4.2.2 Snapper Grouper..... 4-42
4.2.2.1 Essential Fish Habitat..... 4-42
4.2.2.2 Essential Fish Habitat-Habitat Areas of Particular Concern..... 4-42
4.2.3 Coastal Migratory Pelagics..... 4-43
4.2.3.1 Essential Fish Habitat..... 4-43
4.2.3.2 Essential Fish Habitat-Habitat Areas of Particular Concern..... 4-44
4.2.4 Golden Crab..... 4-45
4.2.4.1 Essential Fish Habitat..... 4-45
4.2.4.2 Essential Fish Habitat-Habitat Areas of Particular Concern..... 4-46
4.2.5 Spiny Lobster..... 4-46
4.2.5.1 Essential Fish Habitat..... 4-46
4.2.5.2 Essential Fish Habitat-Habitat Areas of Particular Concern..... 4-46
4.2.6 Coral, Coral Reefs and Live/Hardbottom Habitat..... 4-47
4.2.6.1 Essential Fish Habitat..... 4-47
4.2.6.2 Essential Fish Habitat-Habitat Areas of Particular Concern..... 4-47
4.2.7 Dolphin Wahoo..... 4-49
4.2.7.1 Essential Fish Habitat..... 4-49
4.2.7.2 Essential Fish Habitat-Habitat Areas of Particular Concern..... 4-49
4.3 Cumulative Effects..... 4-51
4.3.1 Biological..... 4-51
4.3.1.1 Effects on protected species..... 4-56
4.3.2 Socioeconomic..... 4-56
4.3.3 Administrative..... 4-56
4.4 Bycatch Practicability Analysis..... 4-56
4.4.1 Population Effects for the Bycatch Species..... 4-57
4.4.1.1 Background..... 4-57
4.4.1.2 Commercial Fishery..... 4-57
4.4.1.3 Recreational Fishery..... 4-57
4.4.1.4 Practicability of Management Measures in Directed Fisheries Relative to their Impact on Bycatch and Bycatch Mortality..... 4-57
4.4.2 Ecological Effects Due to Changes in the Bycatch of the Species..... 4-57
4.4.3 Changes in Bycatch of Other Fish Species and Resulting Population and Ecosystem Effects..... 4-57
4.4.4 Effects on Marine Mammals and Birds..... 4-57
4.4.5 Changes in Fishing, Processing, Disposal, and Marketing Costs..... 4-57
4.4.6 Changes in Fishing Practices and Behavior of Fishermen..... 4-57
4.4.7 Changes in Research, Administration, and Enforcement Costs and Management Effectiveness..... 4-57
4.4.8 Changes in the Economic, Social, or Cultural Value of Fishing Activities and Non-Consumptive Uses of Fishery Resources..... 4-57
4.4.9 Changes in the Distribution of Benefits and Costs..... 4-57
4.4.10 Social Effects..... 4-58
4.4.11 Conclusion..... 4-58
4.5 Unavoidable Adverse Effects..... 4-58
4.6 Effects of the Fishery on the Environment..... 4-58

4.6.1 Effects on Ocean and Coastal Habitats 4-58
4.6.2 Public Health and Safety 4-58
4.6.3 Endangered Species and Marine Mammals 4-58
4.7 Relationship of Short-Term Uses and Long-Term Productivity 4-58
4.8 Irreversible and Irretrievable Commitments of Resources 4-58
4.9 Monitoring and Mitigation Measures 4-58
5 Regulatory Impact Review 5-1
5.1 Introduction 5-1
5.2 Problems and Objectives 5-1
5.3 Methodology and Framework for Analysis 5-1
5.4 Description of the Fishery 5-1
5.5 Impacts of Management Measures 5-1
5.6 Public and Private Costs of Regulations 5-1
5.7 Summary of Economic Impacts 5-1
5.8 Determination of Significant Regulatory Action 5-1
6 Initial Regulatory Flexibility Analysis 6-1
6.1 Introduction 6-1
6.2 Statement of Need for, Objectives of, and Legal Basis for the Rule 6-1
6.3 Identification of All Relevant Federal Rules Which May Duplicate, Overlap, or Conflict with the Proposed Rule 6-1
6.4 Description and Estimate of the Number of Small Entities to Which the Proposed Rule will Apply 6-2
6.5 Description of the Projected Reporting, Record-keeping and Other Compliance Requirements of the Proposed Rule, Including an Estimate of the Classes of Small Entities Which will be Subject to the Requirement and the Type of Professional Skills Necessary for the Preparation of the Report or Records 6-2
6.6 Substantial Number of Small Entities Criterion 6-2
6.7 Significant Economic Impact Criterion 6-2
6.8 Description of Significant Alternatives 6-2
7 Fishery Impact Statement – Social Impact Assessment 7-1
7.1 Summary of Biological Effects 7-1
7.2 Summary of Economic Effects 7-1
7.3 Summary of Social Effects 7-1
7.4 Summary of Administrative Effects 7-1
7.5 Note for CEQ Guidance to Section 1502.22 7-1
7.6 E.O. 12898: Environmental Justice 7-1
8 Other Applicable Law 8-1
8.1 Administrative Procedure Act 8-1
8.2 Information Quality Act 8-1
8.3 Coastal Zone Management Act 8-1
8.4 Endangered Species Act 8-2
8.5 Executive Order 12612: Federalism 8-2
8.6 Executive Order 12866: Regulatory Planning and Review 8-2
8.7 Executive Order 12898: Environmental Justice 8-3
8.8 Executive Order 12962: Recreational Fisheries 8-3
8.9 Executive Order 13089: Coral Reef Protection 8-4

8.10 Executive Order 13158: Marine Protected Areas 8-4
8.11 Marine Mammal Protection Act 8-4
8.12 Migratory Bird Treaty Act and Executive Order 13186 8-5
8.13 National Environmental Policy Act 8-6
8.14 National Marine Sanctuaries Act 8-6
8.15 Paperwork Reduction Act 8-6
8.16 Regulatory Flexibility Act 8-7
8.17 Small Business Act 8-7
8.18 Public Law 99-659: Vessel Safety 8-8
9 List of Preparers 9-1
10 List of Agencies, Organizations, and Persons to Whom Copies of the Statement are Sent 10-1
11 References 11-1
12 Index 1

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

Appendix A. Alternatives Considered but Eliminated from Detailed Consideration.

TABLE OF CONTENTS FOR THE ENVIRONMENTAL ASSESSMENT

Abstract...…….

Summary……...

Purpose and need……

Alternatives…….

Affected environment…….

Environmental consequences……..

List of preparers……..

List of agencies, organizations, and persons
to whom copies of the statement are sent…….

Index……...……

SUMMARY

This Comprehensive Ecosystem-Based Amendment 2 (CE-BA 2) consists of

Purpose and Need

Alternatives Being Considered

Action 1.
Action 2.
Action 3.
Action 4:

Affected Environment

Environmental Consequences
Action 1:

Biological Effects

Economic Effects

Social Effects

Action 2.
Biological Effects

Economic Effects

Social Effects

Action 3:
Biological Effects

Economic Effects

Social Effects

Action 4:
Biological Effects

Economic Effects

Social Effects

1 Introduction

1.1 Purpose and Need

In 2006 the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) 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) to correct if overages occur. Accountability measures 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 the next two reference points, ACL and annual catch target (ACT) are set by managers. The ACT is not required to be specified, but if used should be set at a level that takes into account management uncertainty and provides a low probability of the ACL being exceeded. These measures must be implemented by 2010 for all stocks experiencing overfishing and 2011 for all others.

There are some exceptions for the development of ACLs; for example, when a species can be considered an ecosystem component species and species with annual life cycles. Stocks listed in the Fishery Management Unit (FMU) are classified as either ''in the fishery'' or as an ''ecosystem component''. By default, stocks are considered to be "in the fishery" unless declared ecosystem component species. Ecosystem component (EC) species are exempt from the requirement for ACLs. In addition, EC species may, but are not required to be included in a Fishery Management Plan (FMP) for any of the following reasons: data collection purposes; ecosystem considerations related to specification of optimum yield (OY) for the associated fishery; as considerations in the development of conservation and management measures for the associated fishery; and/or to address other ecosystem issues.

To be considered for possible classification as an EC species, the species should:
(A) Be a non-target species or non-target stock;
(B) Not subject to overfishing, approaching overfished, or overfished;
(C) Not likely to become subject to overfishing or overfished, according to the best available information, in the absence of conservation and management measures; and
(D) Not generally be retained for sale or personal use.

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 amendment proposes to establish MSY, OFL, ACL and AMs for octocorals in the South Atlantic region. Alternatives would give the Council the opportunity to prohibit harvest in Federal waters (ACL = 0) to address directed harvest of EFH or continue to allow harvest of octocorals under the existing Live Rock Aquaculture program. Alternatively, the Council may consider delegating management authority of the octocoral fishery to the State of Florida.

Possible harvest of the invasive orange cup coral, *Tubastraea coccinea* is also addressed in this amendment. The orange cup coral, *Tubastraea coccinea*, is a stony coral not native to the South Atlantic region. The harvest of stony corals is prohibited in the South Atlantic. However, at the request of the Coral AP, the Council may consider the feasibility and implications of allowing harvest of this exotic coral species.

This amendment would make use of the framework procedure established under the Comprehensive Essential Fish Habitat Amendment (SAFMC 1998) to amend Council fishery management plans (FMPs) as needed to designate new or modify existing EFH and Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs).

An action to require that harvest with the use of all non-prohibited fishing gear in South Carolina Special Management Zones (SMZ) be limited to the recreational bag limit is also included in this amendment. This action is necessary due to public concern about commercial exploitation of the state's artificial reefs. Almost all of the South Carolina's 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 has been 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.

1.2 Management Objectives

1.3 History of Management

The following is a summary of management actions for plans amended through this CE-BA 2 (Coral, Coral Reefs and Live/Hardbottom Habitat, list other FMPs being amended). 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- . 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

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.
			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; -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.

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 #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

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.
Notice of Control Date	12/4/08	TBD	Establishes control date for black sea bass pot fishery of the South Atlantic
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 Actions and 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. 1. Establish Maximum Sustainable Yield (MSY) for octocorals in the South Atlantic.

Alternative 1. No action. Do not specify MSY for octocorals in the South Atlantic.
Alternative 2. Specify MSY for octocorals in the South Atlantic region based on Coral AP recommendations.

Option 1. MSY = 11,000 colonies (just above mode of annual harvest for 2000 – 2008).

Option 2. MSY = 49,179 colonies (50K colonies split between GOM and SA based on percentage of harvest).

Option 3. MSY = 30,000 colonies (approximately twice the maximum annual harvest for 2000-2008).

Alternative 3. Specify MSY for octocorals in the South Atlantic region based on SSC recommendations.

2.1.1 Comparison of Alternatives

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

	Alternative 1					
Biological						
Economic						
Social						
Administrative						

2.1.2 Conclusion

	Alternative 1		
Biological			
Economic			
Social			
Administrative			

2.2 Action 2. Establish an Overfishing Level (OFL) for octocorals in the South Atlantic

Alternative1. No action. Do not specify OFL for octocorals in the South Atlantic.
Alternative 2. Specify OFL for octocorals in the South Atlantic based on Coral AP recommendations.

Option 1. OFL = MSY
Option 2. OFL = 13,114 colonies (maximum annual harvest for 2000-2008).
Option 3. OFL = 26,228 colonies (double the maximum annual harvest for 2000-2008).

Alternative 3. Specify OFL for octocorals in the South Atlantic region based on SSC recommendations.

2.2.1 Comparison of Alternatives

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

2.2.2 Conclusion

2.3 Action 3. Establish Acceptable Biological Catch (ABC) for octocorals in the South Atlantic

Alternative 1. No action. Do not specify ABC for octocorals in the South Atlantic.
Alternative 2. Specify ABC for octocorals in the South Atlantic based on Coral AP recommendations

Option 1. ABC = OFL
Option 2. ABC = 13,114 colonies (maximum annual harvest for 2000-2008).
Option 3. ABC = 26,228 colonies (double the maximum annual harvest for 2000-2008).

Alternative 3. Specify ABC for octocorals in the South Atlantic region based on SSC recommendations.

2.3.1 Comparison of Alternatives

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. Establish an Allowable Catch Limit (ACL) for octocorals in the South Atlantic

Alternative 1. No action. Do not specify an ACL for octocorals in the South Atlantic.
Alternative 2. Specify ACLfor octocorals in the South Atlantic based on Coral AP recommendations

Option 1. ACL = 0
Option 2. ACL = ABC
Option 3. ACL = ABC (but no more than 50K colonies aggregate for state and federal waters)
Option 4. ACL = 15,000 colonies (approximately maximum annual harvest plus 10%).
Option 5. ACL = 39,900 colonies (mean harvest 2000-2008 for state and federal waters combined).

Alternative 3. Specify ACL for octocorals in the South Atlantic region based on SSC recommendations.

2.4.1 Comparison of Alternatives

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. Establish Accountability Measures (AMs) for octocorals in the South Atlantic

Alternative 1. No action. Do not specify AMs for octocorals in the South Atlantic.
Alternative 2. Specify AMs for octocorals in the South Atlantic based on Coral AP recommendations

Option 1. Harvest in state waters closes once ACL is met.
Option 2. Reduce following year's harvest by amount of overage.
Option 3. If harvest in state waters reaches 50,000-colony quota, then federal waters are closed to harvest. (NOTE: this option may not constrain harvest to the 50,000 colony quota: when the quota is reached in state waters, there may be additional landings that originated in Federal waters thus making the total harvest upon closure over 50,000 colonies. Should this Option be moved to Appendix?)

Alternative 3. Specify AMs for octocorals in the South Atlantic region based on SSC recommendations.

2.5.1 Comparison of Alternatives

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

	Alternative 1					
Biological						
Economic						
Social						
Administrative						

2.5.2 Conclusion

2.6 Action 6. Modify the existing Live Rock Aquaculture program to allow harvest of octocorals

Alternative 1. No action. Do not modify the existing live rock aquaculture permit system.

NOTE: The live rock aquaculture program already allows for the harvest of octocorals within lease sites. No modification to the exiting program would be necessary to allow for the continued harvest of octocorals if ACL=0 in Federal waters. This action may need to be moved to the Appendix.

Per FWC: There are live rock import issues – for example it is very difficult for LE officers to tell the difference between imported rock and native aquacultured rock. It is often housed in the same holding tanks even though it is not supposed to be.

2.6.1 Comparison of Alternatives

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

	Alternative 1					
Biological						
Economic						
Social						
Administrative						

2.6.2 Conclusion

2.7 Action 7. Transfer management authority of the octocoral fishery to the State of Florida

Alternative 1. No action. Do not transfer management authority of the octocoral fishery to the State of Florida.

Alternative 2. Delegate all management to Florida, but still set an ACL.

Alternative 3. Delegate certain management criteria to Florida but still set the ACL. Management criteria to delegate include:

Subalternative a: fishing season
Subalternative b: trip limits
Subalternative c: permitting?
Subalternative d: enforcement?

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2.7.1 Comparison of Alternatives

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

	Alternative 1					
Biological						
Economic						
Social						
Administrative						

2.7.2 Conclusion

2.8 Action 8. Allow harvest of the exotic stony coral *Tubastrea coccinea*

NOTE: At the Dec. 2009 meeting the Council declared its intent not to go against Florida's rationale for not allowing harvest in state waters. Staff was instructed to draft a policy on invasive species that could be reviewed at the following meeting. The Council needs to clarify their intent to keep this action in CE-BA 2 or send to Appendix.

2.8.1 Comparison of Alternatives

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

	Alternative 1					
Biological						
Economic						
Social						
Administrative						

2.8.2 Conclusion

2.9 Action 9. Amend Council FMPs as needed to designate new or modify existing EFH and EFH-HAPCs.

2.9.1 Comparison of Alternatives

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

	Alternative 1					
Biological						
Economic						
Social						
Administrative						

2.9.2 Conclusion

2.10 Action 10. Require that all harvest with the use of all non-prohibited fishing gear in Special Management Zones in South Carolina be limited to the recreational bag limit.

Alternative 1. No action. Do not require that all harvest with the use of all non-prohibited fishing gear in Special Management Zones in South Carolina be limited to the recreational bag limit.

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

Alternative 3. Transfer management of South Carolina's SMZs to the State.

Alternative 4. Transfer management of SMZs to their respective state.

2.10.1 Comparison of Alternatives

Table 2-10. Summarized comparison of the impacts among alternatives for Action 10.

	Alternative 1					
Biological						
Economic						
Social						
Administrative						

2.10.2 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 soid substrata heavily populated by epibiotic micro- and algoflora (Sorokin 1973). The physical and biological characteristics of a habitat are fundamental to determining whioch organisms live there. Octocorals are functionallty as important as stony corals for habitat topographic complexity.

North Carolina to Cape Canaveral

Coral communities on the outer contincental 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 tis 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 and 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 *Plexaurella dichotoma* (double-forked *Plexaurella*) 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 *Plexaura homomalla* (black sea rod) 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 Octocorals as Essential Fish Habitat

Essential fish habitat (EFH) is defined in the Magnuson-Stevens Fishery Conservation and Management Act as "those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S. C. 1802(10)).

In addition to designating EFH, Councils must also identify EFH-Habitat Areas of Particular Concern (HAPCs) within EFH. In determining which areas should be designated as HAPCs one or more of the following criteria must be met:

1) Ecological function provided by the habitat is important;
2) Habitat is sensitive to human-induced environmental degradation;
3) Development activities are or will be stressing the habitat type; and
4) Habitat type is rare.

Ocotocorals are a primary component of EFH and EFH-HAPCs designated for maged fishery species. Live bottom areas constitute EFH for warm-temperate and tropical species of snappers, groupers and associated fishes (SAFMC 1998a).

Snapper Grouper

Of the 98 species managed by the Council, 73 are included in the snapper grouper complex. The latter includes the families Serranidae (sea basses and groupers), Polyprionidae (wreckfish), Lutjanidae (snappers), Sparidae (porgies), Haemulidae (grunts), Carangidae (jacks), Malacanthidae (tilefishes), Balistidae (triggerfishes), Labridae (wrasses), and Ephippidae (spadefishes). Several of the species in this complex inhabit deepwater habitats or depend on them for a portion of their life cycle (i.e., spawning). Many are slow-growing, late-maturing and long-lived. A more detailed description of the biology and habitat utilization of species in the snapper grouper complex is included in Volume II of the FEP.

Designated EFH utilized by snapper grouper species in (insert relevant EFH). In addition, the Gulf Stream is also EFH because it provides a mechanism to disperse snapper grouper larvae.

Designated EFH-HAPCs for species in the snapper grouper management unit (insert relevant HAPCs)

Coastal Migratory Pelagics

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 (SAFMC in review).

Designated EFH-HAPCs for coastal migratory species includes: The Point (North Carolina); The Charleston Bump (South Carolina); The Hump off Islamorada, Florida; The Marathon Hump off Marathon, Florida; The "Wall" off of the Florida Keys; and pelagic *Sargassum*.

Spiny Lobster
(add EFH for Spiny)

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. 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) recently 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) have produced a shallow water octocoral guide for the South Atlantic Bight from Cape Hatteras, NC to Cape Canaveral, FL.

Table 3. . Common octocoral species from the shallow-water continental shelf regions (less than 200 m 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 1997). 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 *Briarium 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 in review). 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 Endangered Species Act (ESA)-Listed Species

Species listed as endangered or threatened under the ESA, along with any designated critical habitat(s) in the action area, are listed below. A review of the species' biology, population status, distribution, and on-going threats is provided in order to evaluate potential effects of the fishery and proposed action(s) on the listed species, as required by Section 7 of the ESA.

Section 7(a)(2) requires federal agencies ensure any activity they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species or result in destruction or adverse modification of designated critical habitat.

List of Species and Designated Critical Habitat in the Action Area

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*

*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.

Threatened

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

Proposed Species

None

Right Whale 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 EEZ.

Acropora sp. Critical Habitat

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 each specific critical habitat area 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.

(2) Puerto Rico Area: All areas surrounding the islands of the Commonwealth of Puerto Rico, 30-meter (98-foot) in depth and shallower, seaward of the COLREGS line (see 33 CFR 80.738).

(3) St. Thomas/St. John Area: All areas surrounding the islands of St. Thomas and St. John, U.S. Virgin Islands, and smaller surrounding islands, 30-meter (98-foot) in depth and shallower.

(4) St. Croix Area: All areas surrounding the island of St. Croix, U.S. Virgin Islands, 30-meter (98-foot) in depth and shallower.

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.

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).

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.

ESA-Listed Marine Invertebrates

Elkhorn (*Acropora palmata)* and staghorn (*A. cervicornis*) 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).

Species of Concern

NOAA Fisheries Service has created a list of Species of Concern 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, but for which insufficient information is available to indicate a need to list the species under the ESA. 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. To date, no incidental capture of any of these species has been reported in the shrimp fishery or golden crab fishery in the South Atlantic region.

List of Marine Species of Concern in the Southeastern U. S.

Dusky shark	*Carcharhinus obscurus*
Sand tiger shark	*Odontaspis taurus*
Night shark	*Carcharhinus signatus*
Atlantic sturgeon	*Acipenser oxyrhynchus oxyrhynchus*
Mangrove rivulus	*Rivulus mamoratus*
Oposum pipefish	*Microphis barchyurus lineatus*
Key silverside	*Menidia conchorum*
Goliath grouper	*Epinephelus itajara*
Speckled hind	*Epinephelus drummondhayi*

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

Warsaw grouper	*Epinephelus nigritus*
Nassau grouper	*Epinephelus striatus*
Atlantic white marlin	*Tetrapturus albidus*
Ivory Tree Coral	*Oculina varicosa*

3.3 Administrative Environment

3.3.1 The Fishery Management Process and Applicable Laws

3.3.1.1 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 **Section 8.0**. 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.

3.3.1.2 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.

3.3.2 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.

3.4 Human Environment

3.4.1 Description of the Fisheries

3.4.1.1 Octocoral Fishery Description

3.4.1.1.1 *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 2000 indicate that the majority of the harvest (approximately 76%) has occurred on the east coast of Florida **(Figure 1 & Table 1)** 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 2000-2008 show that 70% of average annual landings originate in state waters (**Table 1**). This trend has been anecdotally corroborated by the SAFMC Coral Advisory Panel.

3.4.1.1.2 *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.

3.4.1.1.3 *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.

3.4.1.1.4 *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.

3.4.1.1.5 *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 waters, with total harvest for 2000 through 2008 reported at 85,223 and 460 colonies, respectively (**Tables 1 & 2**). Similarly, harvest in federal waters vs. state waters varies widely with a substantial majority of the landings in east Florida occurring in state waters (**Figure 1**). For the period 2000 through 2008, total harvest for South Atlantic federal and state waters was 85,223 and 273,869 colonies, respectively (**Table 1**). In 2008, a total of 9,831 colonies were harvested from the South Atlantic EEZ and 31,531 came from Florida waters. The total ex-vessel value for 2008 was $153,846 (**Table 1**). Harvest levels have fluctuated over the last several years, with 2006 showing the highest landings (**Figure 1**). 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 1**). 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.).

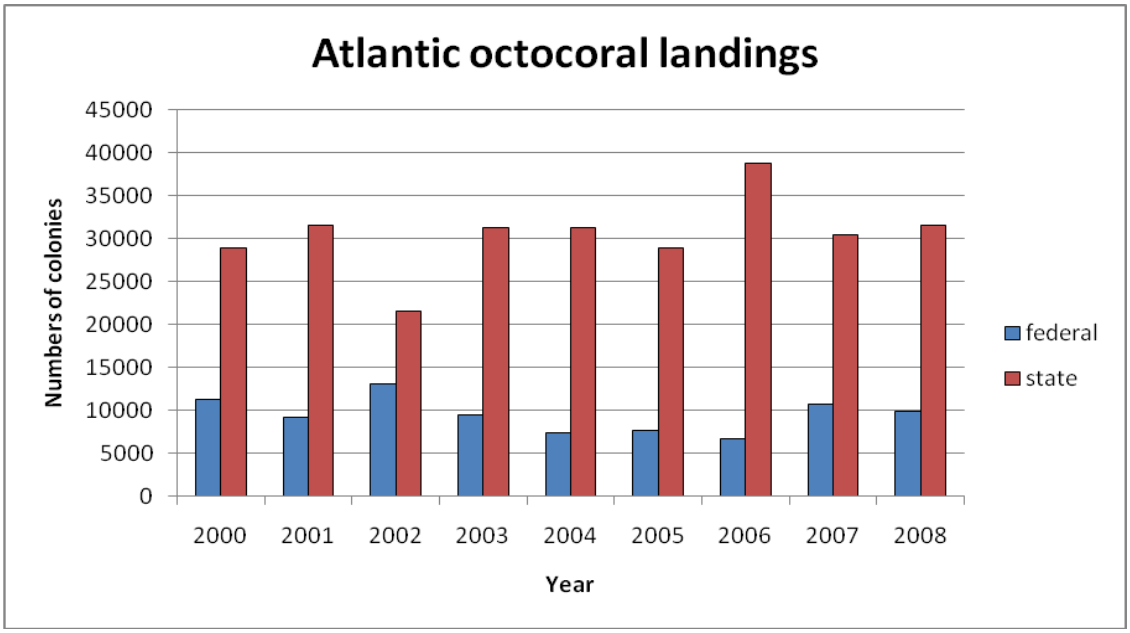

Figure 1. Octocoral harvest in South Atlantic Federal and state waters for the period 2000-2008 (Source: Florida Fish and Wildlife Research Institute).

Table 1. Octocoral harvest (in numbers of colonies) and ex-vessel value for South Atlantic federal and state waters for the period 2000-2008 (Source: Florida Fish and Wildlife Research Institute).

Year	State/Fed Waters	Numbers of colonies	Ex-vessel Value ($)
2000	Federal	11,253	25,509
2001	Federal	9,160	18,235
2002	Federal	13,114	33,116
2003	Federal	9,380	25,910
2004	Federal	7,352	21,370
2005	Federal	7,700	25,899
2006	Federal	6,670	20,594
2007	Federal	10,763	36,804
2008	Federal	9,831	35,747
TOTAL		**85,223**	**225,048**
2000	State	28,895	77,141
2001	State	31,500	87,799
2002	State	21,472	53,682
2003	State	31,187	83,463
2004	State	31,185	87,197
2005	State	28,901	87,557
2006	State	38,805	116,684
2007	State	30,393	102,041
2008	State	31,531	118,099
TOTAL		**273,869**	**813,663**

In the Gulf of Mexico, total octocoral harvest ranged from no harvest in federal waters during 2000-2005 to 5,234 colonies in state waters in 2001 (**Figure 2**). As in the South Atlantic, harvest of octocorals in the Gulf of Mexico occurs mainly in state waters. Total harvest in the EEZ off west Florida for 2000-2008 was only 460 colonies; whereas, total harvest for state waters over the same period was 35,076 colonies (**Table 2**).

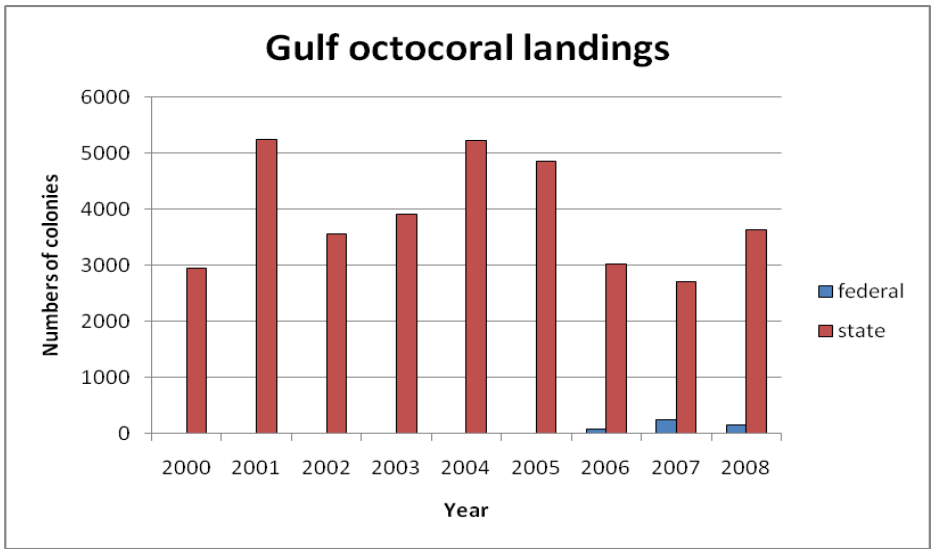

Figure 2. Octocoral harvest in Gulf of Mexico Federal and state waters for the period 2000-2008 (Source: Florida Fish and Wildlife Research Institute).

Table 2. Octocoral harvest (in numbers of colonies) and ex-vessel value for Gulf of Mexico Federal and state waters for the period 2000-2008 (Source: Florida Fish and Wildlife Research Institute).

Year	State/Fed	Numbers of colonies	Ex-vessel value ($)
2000	Federal	0	0
2001	Federal	0	0
2002	Federal	0	0
2003	Federal	0	0
2004	Federal	0	0
2005	Federal	0	0
2006	Federal	75	150
2007	Federal	234	523
2008	Federal	151	375
TOTAL		**460**	**1,048**
2000	State	2952	5,264
2001	State	5234	13,271
2002	State	3552	8,933
2003	State	3917	7,765
2004	State	5221	11,411
2005	State	4851	6,060
2006	State	3017	6,110
2007	State	2708	5,745
2008	State	3624	9,829
TOTAL		**35,076**	**74,387**

3.4.1.1.6 *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.

3.4.1.1.7 *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 *(citations).*

3.4.1.2 Live Rock Aquaculture

The federal live rock aquaculture fishery for the South Atlantic EEZ takes place exclusively in the Florida Keys, mostly due to the narrow continental shelf off Southeast Florida and

unsuitable conditions north of there. In the Florida Keys, most of the federal aquaculture sites are in depths of 30 to 50 feet along the outer reef edge.

Federal live rock aquaculture permits are managed by the NOAA Fisheries Service Southeast Regional Office in St Petersburg, Florida. Applicants must select a suitable site in federal waters, have the site surveyed and approved by a biologist from the Florida Keys National Marine Sanctuary, provide a geologic description of the seed rock to be used, and complete all the necessary paperwork required by NOAA Fisheries Service. Permitting from start to finish can be accomplished in less than three months if the applicant is well prepared, but most applications take longer to be approved.

Development of an approved site requires hard work both above the water and below the water. Collecting and depositing suitable rock is tedious and must be done by hand. Upland rocks, generally purchased from limestone quarries in South Florida, must be transported to the site by boat and then lowered to the bottom in baskets and placed within the designated site boundaries. The average rock size is about 5 pounds and is somewhere between the size of a softball or a football. High quality rocks are irregular in shape and have numerous holes in them. Low quality rocks lack the irregular shape, have few if any holes, and are a denser type of limestone.

Most aquaculturists employ off-season commercial crawfish boats to transport the rock to the site and lower it to the bottom. A medium to large sized trap boat can haul 10,000 pounds of rock, and if the rock site is close to the dock, they can take two or more trips a day to the site. Most of the big rock deposits and underwater stacking activities take place in the late spring, summer, and fall when the commercial boats are available, the weather is consistently favorable, and the water is warm and clear.

To date, all federal sites have been located in sand, so most individuals have opted to lay a foundation of larger, less desirable rocks on the sand, and then build mounds on top of these foundations. Most work is done with SCUBA gear, but some operations use surface supplied air systems which consist of low pressure, high volume air compressors, filters, pressure tanks, and long hoses that have regulators on the ends.

The time required to "grow" a high quality live rock is about two years, but there is a market for one year old "base" rock, and there are maintenance steps that can be taken to produce high quality rock in less than two years. The quality of the seed rock has an impact on how soon it can be harvested and its market value. Hand selected seed rocks will have a higher yield than machine sorted seed rocks.

Vessel types for live rock aquaculture depend on the size of the operation and the type of business. Individuals selling more than a thousand pounds of rock a week generally operate 25 to 35 foot vessels ranging from open, center console skiffs, with outboard motors to traditional, closed cabin vessels with inboard diesel engines. Operations of this size usually have a crew of two or three people, and use mechanical lifting devices such as davits and hydraulic hoists. Individuals selling less than a thousand pounds per week tend to operate out of boats less than 25 feet, have a crew of two people who remove the rock from the water

by hand. These small operators also tend to participate in the marine life fishery, and often mix marine life collecting trips with live rock harvesting stops.

After the rock is harvested, it is usually transported submerged in water to a shore-based facility where it is stored. Most of the rock is shipped by airfreight from Miami or Ft. Lauderdale FL, but some is transported by truck to wholesalers in Tampa, FL where it is then flown out of the Tampa area airports. A limited amount of rock is also shipped by FedEx, UPS, DHL, the United States Postal service, and some is even trucked into the Southeast U.S.

3.4.1.2.1 *Economic description*

Since 2000, aquacultured live rock harvest has been higher in Federal waters that in Florida state waters. According to data collected by FWRI, a total of 1,334,831 pounds of aquacultured live rock was harvested from the South Atlantic EEZ during 2000 to 2008. In contrast, a total of approximately 241,000 pounds was harvested from state waters over the same period (**Table 3; Figure 3**). The landings data show a clear upward trend until 2004, after which landings dropped from over 143,000 pounds in 2005, to just over 71,000 pounds in 2006 (**Table 3; Figure 3**). This precipitous drop was a direct result of two very active hurricane seasons and a disastrous late season hurricane Wilma in October of 2005. Only one upper Florida Keys live rock site remained in production following hurricane Wilma. Landings have remained low over the past few years and, for many, the risks of trying to grow live rock in the exposed offshore waters of the Florida Keys far outweigh the potential benefits.

Table 3. Aquacultured live rock harvest (in numbers of units) and ex-vessel value for South Atlantic federal and state waters for the period 2000-2008 (Source: Florida Fish and Wildlife Research Institute).

Year	State/Fed Waters	Pounds	Ex-vessel Value ($)
2000	Federal	165,512	218,141
2001	Federal	217,692	253,004
2002	Federal	223,946	337,150
2003	Federal	199,581	300,480
2004	Federal	209,526	350,850
2005	Federal	143,444	267,428
2006	Federal	71,163	171,450
2007	Federal	64,895	168,810
2008	Federal	39,072	108,428
TOTAL		**1,334,831**	**2,175,741**
2000	State	24,883	41,245
2001	State	18,945	34,031
2002	State	3,324	3,817
2003	State	21,146	34,791
2004	State	44,728	91,026
2005	State	14,303	22,297
2006	State	44,826	169,523

2007	State	34,289	128,787
2008	State	34,458	101,479
TOTAL		**240,902**	**626,996**

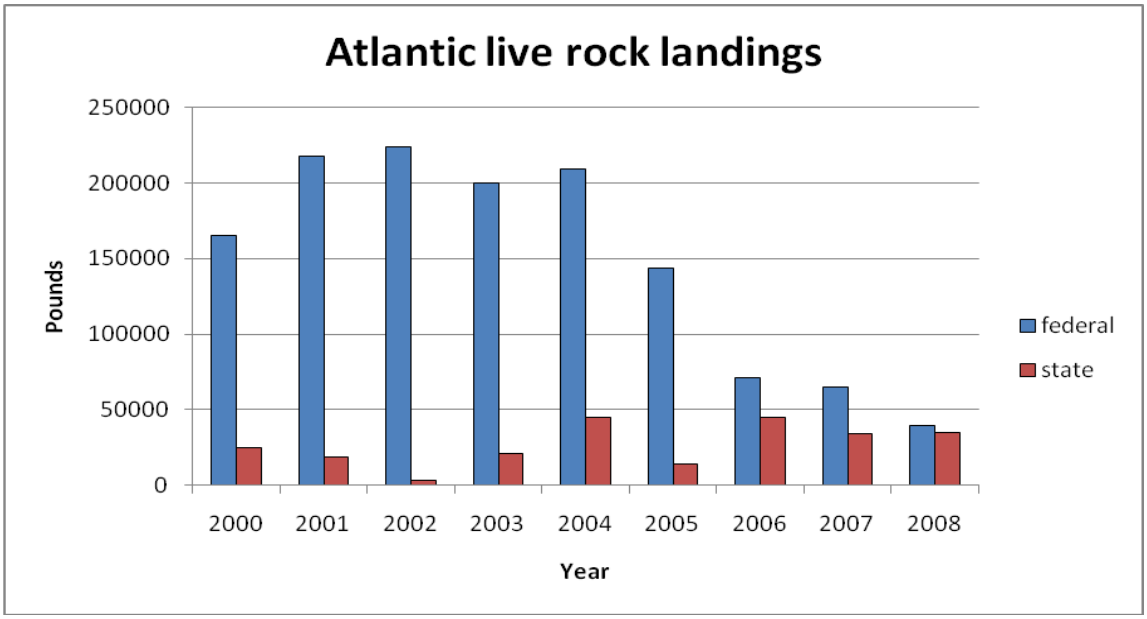

Figure 3. Aquacultured live rock harvest in South Atlantic Federal and state waters for the period 2000-2008 (Source: Florida Fish and Wildlife Research Institute).

The ex vessel price for high quality live rock is around $2.00 a pound, but the price can vary depending on the market and season. There is a considerable amount of price competition associated with cheap imports from Haiti and Southeast Asia, which has kept the price at or below the $2.00 per pound value for the last 15 years. Aquacultured live rock is generally denser and less porous than imported wild live rock, which detracts from its value. However, aquacultured live rock also tends to have more living organisms on it, which increases its value. Other positive selling points for the aquacultured rock are that it is domestically produced, may contain live stony corals, and it is not harvested from a natural reef.

3.4.1.2.2 *Social and cultural environment*

Live rock aquaculture is primarily a Florida based fishery with state and federal aquaculture sites on both coasts of Florida. Along the East Coast of Florida in the South Atlantic EEZ, all of the aquaculture sites are in the Florida Keys from about Tavernier to Key West. Most of the permit holders are also marine life fishermen, and the live rock is one of many products they harvest for the marine ornamental trade. Most live rock producers operate a small business with less than 5 employees, and most sell their product out of the state to wholesalers and pet shops, or directly to hobbyists. Prior to the active hurricane seasons of 2004 and 2005, there were several companies based outside of the Florida Keys that were almost exclusively dependent on live rock for their income, but after losing everything to multiple hurricanes, they have moved their operations out of the Florida Keys or have gotten out of the business completely. The surviving live rock operations are those who do not depend on live rock for much more than 20% of their gross income.

3.4.1.2.3 *Bycatch*

Bycatch associated with live rock harvest is varied and often sold as part of the product. Macro algae, sponges, bryozoans, octocorals, and stony corals, which attach to the rock, add value and determine what type of rock it can be sold as. Not all of these sessile organisms are desirable, so the rocks are sometimes "cleaned" on the bottom or on the boat so undesirable organisms are not taken to the holding facilities.

Another type of bycatch associated with live rock harvest is the numerous crabs, shrimps, snails, worms, and tiny fish, which cling to the rocks or hide in the crevices of the rocks. Often, a quick shake on the bottom loosens up a lot of these small fish and invertebrates, but many remain attached to the rock and are brought to the surface. Once on the boat, most producers sort the rock and place it into holding tanks for transport to shore, so the sorting process also releases some of the attached organisms, which are then dumped overboard. Whatever remains on the rock is taken to shore and ends up in shore-based holding facilities, and some organisms are shipped to the buyer still attached to the rock.

All of the bycatch associated with live rock aquaculture is inherently created by this method of harvest. Although there is bycatch associated with this industry, it is a bycatch that is essentially produced in conjunction with the production of live rock. In many ways, offshore live rock aquaculture is a type of polyculture, because many different organisms are raised at the same time on the same site. Live rock aquaculture operations are net producers of marine life because whole communities of fish and invertebrates establish themselves around the live rock site and although the harvest operations disturb these communities, they continue to thrive there from year to year.

3.4.1.3 South Carolina Special Management Zones

3.4.1.3.1 *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.

3.4.1.3.2 *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 Essential Fish Habitat and Essential

4.2 Fish Habitat Areas of Particular Concern

The following presents a description of the Council's habitat conservation (EFH) mandates, a summary of the existing EFH and EFH-HAPC designations for managed species, and a listing of maps that have been created and are being served through the Council's Habitat and Ecosystem Internet Map Server.

The EFH Mandate and EFH Final Rule

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

The definition for EFH may include habitat for an individual species or an assemblage of species, whichever is appropriate within each FMP. For the purpose of interpreting 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 productive water bodies.

"Necessary", relative to the definition of EFH, means the habitat required to support a sustainable fishery and a healthy ecosystem, while "spawning, breeding, feeding, or growth to maturity" covers a species full life cycle. In the context of this definition the term "substrate" includes sediment, hardbottom, 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. Migratory routes such as rivers and passes serving as passageways to and from anadromous fish spawning grounds should also be considered EFH. Included in the interpretation of "substrate" are artificial reefs and shipwrecks (if providing EFH), and partially or entirely submerged structures such as jetties.

The NOAA Fisheries Service assists the Councils in implementing EFH by assessing the quality of available data in 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 within EFH. In determining which areas should be designated as HAPCs the area must meet one or more of the following criteria:

1) Ecological function provided by the habitat is important;
2) Habitat is sensitive to human-induced environmental degradation;
3) Development activities are or will be stressing the habitat type; and
4) Habitat type is rare.

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

The Magnuson-Stevens Act, Public Law 104-208, reflects the new Secretary of Commerce and Fishery Management Council authority and responsibilities for the protection of essential fishery habitat. Section 305 (b) Fish Habitat, indicates the Secretary (through NOAA Fisheries Service) shall, within 6 months of the date of enactment of the Sustainable Fisheries Act, establish by regulation guidelines 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) shall: 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, shall 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 the Secretary shall 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 establishes 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 would use to coordinate, consult, or provide recommendations on Federal and State activities that may adversely affect EFH. The intended effect of the rule was 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 FMPs. The final rule provides more clear guidelines for prioritizing and analyzing habitat effects for managed species. The final rule retains the four tiered level for data division 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 Fishery Ecosystem Plan (SAFMC in prep.) updates EFH information in the Habitat Plan (SAFMC 1998a) 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 the Habitat and Coral Advisory Panels and through a series of workshops, identified available environmental and fisheries data sources relevant to the managed species that would be useful in describing and identifying EFH. The EFH workshop process utilized habitat experts at the State, Federal, and regional level to participate in the description and identification of EFH in the South Atlantic region.

Based on the ecological relationships of species and relationships between species and their habitat, the Council took an ecosystem approach in designating EFH in the Habitat Plan and Comprehensive Ecosystem-Based Amendment and in refining the information presented in the FEP (SAFMC in prep.) for managed species and species assemblages. This approach is consistent with NMFS guidelines and broader goals for ecosystem management. Through

the existing habitat policy, the Council directs the protection of EFH types and the enhancement and restoration of their quality and quantity.

The EFH Final Rule

The Final EFH Rule requires FMPs 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. Maps should identify the different types of habitat designated as EFH to the extent possible. Maps should explicitly distinguish EFH from non-EFH areas and should 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, data availability do not support such use at this time for the South Atlantic. Instead, the best use of GIS within the South Atlantic is visualizing where EFH occurs within the constraints of available information.

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.

Maps of EFH and EFH-HAPCs

The Council has developed an Internet Map Server (IMS) for displaying EFH and HAPCs within the constraints of available data and technology. The IMS contains GIS layers showing the distribution and geographic limits of EFH by life history stage (**Figure 4-23**). 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. Many were consolidated and homogenized from other sources. The Council encourages use of these data and urges users to thoroughly review the metadata and original source documentation prior to interpreting the data. It is the user's responsibility to ensure data are used in a manner consistent with their intended purpose and within stated limitations.

As new data become available, the Council will update the IMS to ensure the public has the best available spatial depictions of the EFH descriptions in the Comprehensive EFH Amendment (SAFMC 1988b) and future Comprehensive Ecosystem-Based Amendments.

While the Council believes spatial depictions of EFH and HAPCs are informative, textual descriptions within the Comprehensive EFH Amendment (SAFMC 1988b) are the ultimate source for determining the limits of EFH and HAPCs. The IMS can be found at: http://ocean.floridamarine.org/efh_coral/ims/viewer.htm.

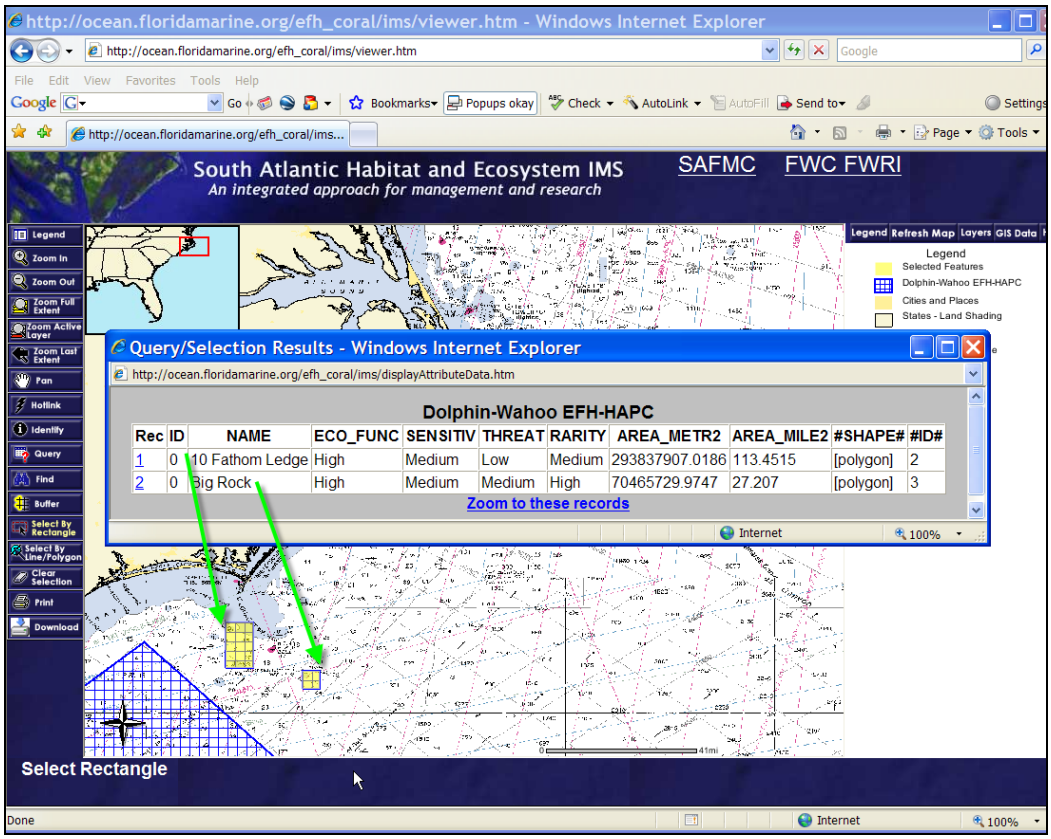

Figure 4-23. Sample screen shot of spatial presentation of EFH-HAPCs on South Atlantic Habitat and Ecosystem Internet Map Server.

The Habitat Plan (SAFMC 1998a) and FEP (SAFMC in prep.) present 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 (1999) 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 is considering evidence that some fishing practices may have an identifiable adverse effect on habitat and is addressing those pertaining to deepwater coral ecosystems in

this document. The Council, as indicated in the previous section, 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 HAPCs; and harvest limits.

The FEP (SAFMC in prep.) identifies non-fishing related activities that have the potential to adversely affect EFH quantity or quality. Examples of these activities are dredging, fill, excavation, mining, impoundment, discharge, water diversions, thermal additions, 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 FEP is an analysis of how fishing and non-fishing activities influence habitat function on an ecosystem or watershed scale. 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 FEP. 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 FEP as new information becomes available. NMFS should provide some of this information as part of the annual Stock Assessment and Fishery Evaluation (SAFE) report. A complete update of the FEP and assessment of EFH information will also be conducted as recommended in the guidelines in no longer than 5 years.

The Council established a framework procedure whereby additional EFH and EFH-HAPCs designations would be accomplished. This is described in Section 4.2.8 of the Comprehensive EFH Amendment (SAFMC 1998b).

4.2.1 Penaeid and deepwater shrimp

Three penaeid species (white shrimp, *Litopenaeus setiferus*; brown shrimp, *Farfantepenaeus aztecus*; and pink shrimp, *Farfantepenaeus duorarum*) and one deepwater species (rock shrimp, *Sicyonia brevirostris*) are included in the shrimp fishery management unit. See **section 3.2.1.3** for more detailed descriptions of the rock shrimp and royal red shrimp resources. Additional information on species in the shrimp fishery is included in Volume II of the FEP.

4.2.1.1 Essential Fish Habitat

Penaeid Shrimp

For penaeid shrimp, EFH includes inshore estuarine nursery areas, offshore marine habitats used for spawning and growth to maturity, and all interconnecting water bodies as described in the Council Habitat Plan (SAFMC 1998a). Inshore nursery areas include tidal freshwater (palustrine), estuarine, and marine emergent wetlands (e.g., intertidal marshes); tidal palustrine forested areas; mangroves; tidal freshwater, estuarine, and marine submerged aquatic vegetation (e.g., seagrass); and subtidal and intertidal non-vegetated flats. This applies from North Carolina through the Florida Keys.

Rock Shrimp

For rock shrimp, EFH consists of offshore terrigenous and biogenic sand bottom habitats from 18 to 182 meters (59-597 feet) in depth with highest concentrations occurring between 34 and 55 meters (111-180 feet). This applies for all areas from North Carolina through the Florida Keys. EFH includes the shelf current systems near Cape Canaveral, Florida which provide major transport mechanisms affecting planktonic larval rock shrimp. These currents keep larvae on the Florida Shelf and may transport them inshore in spring. In addition the Gulf Stream is an EFH because it provides a mechanism to disperse rock shrimp larvae.

4.2.1.2 Essential Fish Habitat-Habitat Areas of Particular Concern

Penaeid Shrimp

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

Estuarine tidal creeks and salt marshes that serve as nursery grounds are perhaps the most important habitats occupied by penaeid shrimp. The major factor controlling shrimp growth and production is the availability of nursery habitat. Remaining wetland habitat must be protected if present production levels are to be maintained. In addition, impacted habitats must be restored if future production is to be increased. Other areas of specific concern are the barrier islands since these land masses are vital to the maintenance of estuarine conditions needed by shrimp during their juvenile stage. Passes between barrier islands into estuaries also are important since the slow mixing of sea water and fresh water are also of prime importance to estuarine productivity.

In North Carolina, EFH-HAPCs include estuarine shoreline habitats since juveniles congregate here. Seagrass beds, prevalent in the sounds and bays of North Carolina and Florida, are particularly critical areas. Core Sound and eastern Pamlico Sound, based on a preliminary aerial survey funded through the Albemarle-Pamlico Estuarine Study, have approximately 800 square kilometers (200,000 acres) of seagrass beds making North Carolina second only to Florida in abundance of this type of habitat (Department of Commerce 1988b). In subtropical and tropical regions shrimp and spiny lobster postlarvae recruit into grass beds from distant offshore spawning grounds (Fonseca *et al.* 1992).

South Carolina and Georgia lack seagrass beds. Here, the nursery habitat of shrimp is the high marsh areas with shell hash and mud bottoms. In addition, there is seasonal movement out of the marsh into deep holes and creek channels adjoining the marsh system during winter. Therefore, the area of particular concern for early growth and development encompasses the entire estuarine system from the lower salinity portions of the river systems through the inlet mouths.

Section 600.815 (a) (8) of the final rule on EFH determinations recognizes that subunits of EFH may be of particular concern. A summary evaluation of the EFH-HAPC as it relates to the criteria is shown in **Table 4-11**.

Table 4-11. Summary evaluation of the EFH-HAPC for shrimp as it relates to the criteria.

EFH-HAPC and Criteria Evaluation	Ecological Function	Sensitivity to Environmental Degradation	Threat from Development Activities	Rarity of Habitat
Coastal inlets	High	Low	Medium	Medium
State-designated nursery habitats	High	High	Medium	High
State-identified overwintering habitats	Medium	Low	Medium	Medium
High marsh areas with shell hash and mud bottom in SC and GA	High	Medium	Medium	Medium

Rock Shrimp
No EFH-HAPCs have been identified for rock shrimp; however, deepwater habitat (e.g., the rock shrimp closed area/proposed expanded Oculina Bank HAPC) may serve as nursery habitat and protect the stock by providing a refuge for rock shrimp.

4.2.2 Snapper Grouper

Of the 98 species managed by the Council, 73 are included in the snapper grouper complex. The latter includes the families Serranidae (sea basses and groupers), Polyprionidae (wreckfish), Lutjanidae (snappers), Sparidae (porgies), Haemulidae (grunts), Carangidae (jacks), Malacanthidae (tilefishes), Balistidae (triggerfishes), Labridae (wrasses), and Ephippidae (spadefishes). Several of the species in this complex inhabit deepwater habitats or depend on them for a portion of their life cycle (i.e., spawning). Many are slow-growing, late-maturing and long-lived. A more detailed description of the biology and habitat utilization of species in the snapper grouper complex is included in Volume II of the FEP.

4.2.2.1 Essential Fish Habitat

Essential Fish Habitat utilized by snapper grouper species in this region 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.

4.2.2.2 Essential Fish Habitat-Habitat Areas of Particular Concern

Areas which meet the criteria for 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).

Areas that meet the criteria for designating EFH-HAPCs include habitats required during each life stage (including egg, larval, postlarval, juvenile, and adult stages). **Table 4-12** below is a summary evaluation of the EFH-HAPC as it relates to the criteria.

Table 4-12. Summary evaluation of the 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

4.2.3 Coastal Migratory Pelagics

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.

4.2.3.1 Essential Fish Habitat

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

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

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.

4.2.3.2 Essential Fish Habitat-Habitat Areas of Particular Concern

Areas which meet the criteria for EFH-HAPCs include sandy shoals of Cape Lookout, Cape Fear, and Cape Hatteras from shore to the ends of the respective shoals, but shoreward of the Gulf stream; The Point, The Ten-Fathom Ledge, and Big Rock (North Carolina); The Charleston Bump and Hurl Rocks (South Carolina); The Point off Jupiter Inlet (Florida); *Phragmatopoma* (worm reefs) reefs off the central east coast of Florida; nearshore hardbottom south of Cape Canaveral; The Hump off Islamorada, Florida; The Marathon Hump off Marathon, Florida; The "Wall" off of the Florida Keys; Pelagic *Sargassum*; and Atlantic coast estuaries with high numbers of Spanish mackerel and cobia based on abundance data from the ELMR Program. Estuaries meeting this criteria for Spanish mackerel include Bogue Sound and New River, North Carolina: Bogue Sound, North Carolina (Adults May-September salinity >30 ppt); and New River, North Carolina (Adults May-October salinity >30 ppt). For cobia they include Broad River, South Carolina; and Broad River, South Carolina (Adults & juveniles May-July salinity >25ppt). A summary evaluation of the EFH-HAPC as it relates to the criteria is presented in **Table 4-13**.

Table 4-13. Summary evaluation of the EFH-HAPC for coastal migratory pelagics as it relates to the criteria.

EFH-HAPC and Criteria Evaluation	Ecological Function	Sensitivity to Environmental Degradation	Threat from Development Activities	Rarity of Habitat
Sandy shoals of Cape Lookout, Cape Fear and Cape Hatteras (from shore to the end of shoals but shoreward from Gulf Stream)	Medium	Low	Medium	Medium
The Point, NC	Medium	Low	Medium	High
The Ten Fathom Ledge, NC	Medium	Low	Medium	Medium
Big Rock, NC	Medium	Low	Low	Medium
Charleston Bump, SC	Medium	Low	Medium	Medium
Hurl Rocks, SC	Medium	Low	Medium	Medium
The Point off Jupiter Inlet, FL	Medium	Low	Low	Low
Phragmatopoma (worm reefs) reefs off central E. coast of FL	High	Medium	Medium	High
nearshore hardbottom south of Cape Canaveral, FL	High	High	High	High
The Hump off Islamorada, FL	Medium	Low	Low	Medium
The Marathon Hump, FL	High	Low	Low	Medium
Pelagic Sargassum	High	Low	Low	Medium
Bogue Sound and New River estuaries, NC (Spanish mackerel)	High	High	High	Medium
Broad River, SC (cobia)	High	High	High	Medium

4.2.4 Golden Crab

The golden crab, *Chaceon fenneri*, is a deepwater species found mainly on the continental slope of Bermuda and the southeastern United States from off Chesapeake Bay south through the Straits of Florida and into the eastern Gulf of Mexico. See **section 3.2.1.2** of this document for more detailed information on this species. Additional information is included in Volume II of the FEP.

4.2.4.1 Essential Fish Habitat

EFH for golden crab includes the U.S. Continental Shelf from Chesapeake Bay south through the Florida Straits (and into the Gulf of Mexico). In addition, the Gulf Stream, which occurs within the EEZ, is an EFH because it provides a mechanism to disperse golden crab larvae. The detailed description of seven EFH types (a flat foraminferan ooze habitat; distinct mounds, primarily of dead coral; ripple habitat; dunes; black pebble habitat; low outcrop; and soft-bioturbated habitat) for golden crab is provided in Wenner *et al.* (1987).

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.

4.2.4.2 Essential Fish Habitat-Habitat Areas of Particular Concern

There is insufficient knowledge of the biology of golden crabs to identify spawning and nursery areas and to identify EFH-HAPCs at this time. As information becomes available, the Council will evaluate such data and identify HAPCs as appropriate through the framework.

4.2.5 Spiny Lobster

Spiny lobsters inhabit tropical and subtropical waters of the Atlantic Ocean, Caribbean Sea, and Gulf of Mexico. Spiny lobsters get their name from the forward-pointing spines that cover their bodies to help protect them from predators. They vary in color from almost white to dark red-orange. Two large, cream-colored spots on the top of the second segment of the tail make spiny lobsters easy to identify (FWC, http://www.floridamarine.org/features/view_article.asp?id=4128). Spiny lobsters are managed jointly with the Gulf of Mexico Fishery Management Council. A more detailed description of the biology and habitat utilization of the spiny lobster is included in Volume II of the FEP.

4.2.5.1 Essential Fish Habitat

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

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.

4.2.5.2 Essential Fish Habitat-Habitat Areas of Particular Concern

Areas which meet the criteria for EFH-HAPCs for spiny lobster include Florida Bay, Biscayne Bay, Card Sound, and coral/hardbottom habitat from Jupiter Inlet, Florida through the Dry Tortugas, Florida. A summary evaluation of the EFH-HAPC as it relates to the criteria is presented in **Table 4-14**.

Table 4-14. Summary evaluation of the EFH-HAPC for spiny lobster as it relates to the criteria.

EFH-HAPC and Criteria Evaluation	Ecological Function	Sensitivity to Environmental Degradation	Threat from Development Activities	Rarity of Habitat
Florida Bay	High	High	Medium	Medium
Biscayne Bay	High	High	Medium	Medium
Card Sound	High	High	Medium	Medium

Coral/hardbottom habitat from Jupiter Inlet through the Dry Tortugas, FL	High	High	High	High

4.2.6 Coral, Coral Reefs and Live/Hardbottom Habitat

The management unit for coral includes coral belonging to the Class Hydrozoa (fire corals and hydrocorals) and coral belonging to the Class Anthozoa (sea fans, whips, precious corals, sea pens and stony corals). Coral reefs constitute hardottoms, deepwater banks, patch reefs and outer bank reefs as defined in the Coral, Coral Reefs and Live/Hardbottom Habitat FMP (SAFMC 1982). In addition, live rock comprises living marine organisms, or an assemblage thereof, attached to a hard substrate, including dead coral or rock (but excluding individual mollusk shells). See **section 3.2.1.1** of this document for more detailed information on deepwater coral species included in the management unit. Additional information on deep and shallow water corals is included in Volume II of the FEP.

4.2.6.1 Essential Fish Habitat

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.

4.2.6.2 Essential Fish Habitat-Habitat Areas of Particular Concern

Areas which meet the criteria for 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. A summary evaluation of the EFH-HAPC as it relates to the criteria is in **Table 4-15.**

Table 4-15. 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

4.2.7 Dolphin Wahoo

The Fishery Management Plan for dolphin (*Coryphaena hippurus*) and wahoo (*Acanthocybium solandri*) is intended to conserve and manage dolphin and wahoo off the Atlantic states (Maine through the east coast of Florida), and to ensure that no new fisheries for dolphin and wahoo develop. A more detailed description of the biology and habitat utilization of dolphin and wahoo is included in Volume II of the FEP.

4.2.7.1 Essential Fish Habitat

Essential Fish Habitat (EFH) for dolphin and wahoo is the Gulf Stream, Charleston Gyre, Florida Current, and pelagic *Sargassum*.

Note: This EFH definition for dolphin was approved by the Secretary of Commerce on June 3, 1999 as a part of the South Atlantic Council's Comprehensive Habitat Amendment (SAFMC 1998b) (dolphin was included within the Coastal Migratory Pelagics FMP). This definition does not apply to extra-jurisdictional areas. A detailed description of the pelagic habitats used by dolphin and wahoo is presented in the Habitat Plan and Volume II of the Fishery Ecosystem Plan.

4.2.7.2 Essential Fish Habitat-Habitat Areas of Particular Concern

EFH-HAPCs for dolphin and wahoo in the Atlantic include The Point, The Ten-Fathom Ledge, and Big Rock (North Carolina); The Charleston Bump and The Georgetown Hole (South Carolina); The Point off Jupiter Inlet (Florida); The Hump off Islamorada, Florida;

The Marathon Hump off Marathon, Florida; The "Wall" off of the Florida Keys; and pelagic *Sargassum.*

Note: This EFH-HAPC definition for dolphin was approved by the Secretary of Commerce on June 3, 1999 as a part of the South Atlantic Council's Comprehensive Habitat Amendment (dolphin was included within the Coastal Migratory Pelagics FMP). The following table (**Table 4-16**) is a summary evaluation of the EFH-HAPC as it relates to the criteria.

Table 4-16. Summary evaluation of the EFH-HAPC for dolphin and wahoo 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	High	Medium	Medium	High
The Ten Fathom Ledge	High	Medium	Low	Medium
Big Rock	High	Medium	Medium	High
The Charleston Bump	High	Low	Medium	High
The Georgetown Hole	High	Low	Low	High
The Point off Jupiter Inlet	High	Medium	Low	High
The Hump off Islamorada	High	Low	Low	High
The Marathon Hump	High	Medium	Low	High
The Wall off of the Florida Keys	Medium	Medium	Low	Medium
Pelagic *Sargassum*	High	Medium	Low	High

The EFH-HAPCs for dolphin and wahoo all meet at least one or more of the above criteria. This action enables the Councils to protect these EFH-HAPCs effectively and take timely actions when necessary. This could prevent further decreases in biological productivity and may lead to possible increases in yield of fish stocks.

This evaluation is based on information presented in the Habitat Plan (SAFMC 1998a) and Comprehensive EFH Amendment (SAFMC 1998b) and further supported by the Fishery Ecosystem Plan (SAFMC in prep.) which in combination describe the characteristics of the unique habitat type and where available specific descriptions of the habitat associated with the designated or proposed EFH-HAPC. In addition, supporting rationale for designation including identified threats from fishing and non-fishing activities is presented in the Habitat Plan (SAFMC 1998a), the Comprehensive EFH Amendment (SAFMC 1998b), the *Sargassum* Fishery Management Plan (SAFMC 2002b), and Fishery Ecosystem Plan (SAFMC in prep.) and are included herein by reference.

4.3 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.

4.3.1 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

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.

4.3.1.1 Effects on protected species

4.3.2 Socioeconomic

4.3.3 Administrative

4.4 Bycatch Practicability Analysis

The Council is required by MSFCMA §303(a)(11) to establish a standardized bycatch reporting methodology for federal fisheries and to identify and implement conservation and management measures that, to the extent practicable and in the following order: (A) minimize bycatch and (B) minimize the mortality of bycatch that cannot be avoided. The MSFCMA defines bycatch as "fish which are harvested in a fishery, but which are not sold or kept for personal use, and includes economic discards and regulatory discards. Such term does not include fish released alive under a recreational catch-and-release fishery management program" (MSFCMA §3(2)). Economic discards are species that are discarded because they are undesirable to the harvester. This category of discards generally includes certain species, sizes, and/or sexes with low or no market value. Regulatory discards are species required by regulation to be discarded, but also include fish that may be retained but not sold.

NMFS outlines at 50 CFR §600.350(d)(3)(i) ten factors that should be considered in determining whether a management measure minimizes bycatch or bycatch mortality to the extent practicable. These are:

1. Population effects for the bycatch species;
2. Ecological effects due to changes in the bycatch of that species (effects on other species in the ecosystem);
3. Changes in the bycatch of other species of fish and the resulting population and ecosystem effects;
4. Effects on marine mammals and birds;
5. Changes in fishing, processing, disposal, and marketing costs;
6. Changes in fishing practices and behavior of fishermen;
7. Changes in research, administration, enforcement costs and management effectiveness;
8. Changes in the economic, social, or cultural value of fishing activities and non-consumptive uses of fishery resources;
9. Changes in the distribution of benefits and costs; and

10. Social effects.

Agency guidance provided at 50 CFR §600.350(d)(3)(ii) suggests the Councils adhere to the precautionary approach found in the Food and Agriculture Organization of the United Nations (FAO) Code of Conduct for Responsible Fisheries (Article 6.5) when faced with uncertainty concerning these ten practicability factors. According to Article 6.5 of the FAO Code of Conduct for Responsible Fisheries, using the absence of adequate scientific information as a reason for postponing or failing to take measures to conserve target species, associated or dependent species, and non-target species and their environment, would not be consistent with a precautionary approach.

4.4.1 Population Effects for the Bycatch Species

4.4.1.1 Background

4.4.1.2 Commercial Fishery

4.4.1.3 Recreational Fishery

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

4.4.2 Ecological Effects Due to Changes in the Bycatch of the Species

4.4.3 Changes in Bycatch of Other Fish Species and Resulting Population and Ecosystem Effects

4.4.4 Effects on Marine Mammals and Birds

4.4.5 Changes in Fishing, Processing, Disposal, and Marketing Costs

4.4.6 Changes in Fishing Practices and Behavior of Fishermen

4.4.7 Changes in Research, Administration, and Enforcement Costs and Management Effectiveness

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

4.4.9 Changes in the Distribution of Benefits and Costs

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4.4.10 Social Effects

4.4.11 Conclusion

4.5 Unavoidable Adverse Effects

4.6 Effects of the Fishery on the Environment

4.6.1 Effects on Ocean and Coastal Habitats

4.6.2 Public Health and Safety

4.6.3 Endangered Species and Marine Mammals

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

4.8 Irreversible and Irretrievable Commitments of Resources

4.9 Monitoring and Mitigation Measures

5 Regulatory Impact Review

5.1 Introduction

The NOAA Fisheries Service (NMFS) requires a Regulatory Impact Review (RIR) for all regulatory actions that are of public interest. The RIR does three things: (1) it provides a comprehensive review of the level and incidence of impacts associated with a proposed or final regulatory action; (2) it provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives that could be used to solve the problem; and (3) it ensures that the regulatory agency systematically and comprehensively considers all available alternatives so that the public welfare can be enhanced in the most efficient and cost-effective way. The RIR also serves as the basis for determining whether the proposed regulations are a 'significant regulatory action' under the criteria provided in Executive Order (E.O.) 12866 and provides information that may be used in conducting an analysis of impacts on small business entities pursuant to the Regulatory Flexibility Act (RFA). This RIR analyzes the expected impacts of this action on the commercial and recreational snapper grouper fisheries, with particularly focus on the gag and vermilion snapper fisheries. Additional details on the expected economic effects of the various alternatives in this action are included in **Section 4.0** and are incorporated herein by reference.

5.2 Problems and Objectives

5.3 Methodology and Framework for Analysis

This RIR assesses management measures from the standpoint of determining the resulting changes in costs and benefits to society. To the extent practicable, the net effects of the proposed measures are stated in terms of producer and consumer surplus, changes in profits, and participation by for-hire vessel fishermen and private anglers. In addition, the public and private costs associated with the process of developing and enforcing regulations of this amendment are provided.

5.4 Description of the Fishery

5.5 Impacts of Management Measures

5.6 Public and Private Costs of Regulations

5.7 Summary of Economic Impacts

5.8 Determination of Significant Regulatory Action

Pursuant to E.O. 12866, a regulation is considered a 'significant regulatory action' if it is expected to result in: (1) an annual effect of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities; (2) create a serious inconsistency or otherwise interfere with an action taken or planned by

another agency; (3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights or obligations of recipients thereof; or (4) raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this executive order.

6 Initial Regulatory Flexibility Analysis

6.1 Introduction

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

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

In addition to the information provided in this section, additional information on the expected economic impacts of the proposed action was presented in **Sections 4.0** and **5.0** and is included herein by reference.

6.2 Statement of Need for, Objectives of, and Legal Basis for the Rule

6.3 Identification of All Relevant Federal Rules Which May Duplicate, Overlap, or Conflict with the Proposed Rule

6.4 Description and Estimate of the Number of Small Entities to Which the Proposed Rule will Apply

6.5 Description of the Projected Reporting, Record-keeping and Other Compliance Requirements of the Proposed Rule, Including an Estimate of the Classes of Small Entities Which will be Subject to the Requirement and the Type of Professional Skills Necessary for the Preparation of the Report or Records

6.6 Substantial Number of Small Entities Criterion

6.7 Significant Economic Impact Criterion

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

Disproportionality: Do the regulations place a substantial number of small entities at a significant competitive disadvantage to large entities?

All entities that are expected to be affected by the proposed rule are considered small entities so the issue of disproportionality does not arise in the present case.

Profitability: Do the regulations significantly reduce profit for a substantial number of small entities?

6.8 Description of Significant Alternatives

The Council's preferred alternatives are:

7 Fishery Impact Statement – Social Impact Assessment

7.1 Summary of Biological Effects

7.2 Summary of Economic Effects

7.3 Summary of Social Effects

7.4 Summary of Administrative Effects

7.5 Note for CEQ Guidance to Section 1502.22

In accordance with the CEQ Guidance for 40 CFR Section 1502.22 of the NEPA (1986), the Council has made "reasonable efforts, in the light of overall costs and state of the art, to obtain missing information which, in its judgment, is important to evaluating significant adverse impacts on the human environment"…At this time, the Council has made reasonable efforts in light of the costs, to obtain additional social and community information in order to analyze the social impacts of the proposed actions and alternatives. However, additional sociologists or anthropologists and funding are needed to conduct community surveys and needed enthnographies that would allow a comprehensive analysis.

7.6 E.O. 12898: Environmental Justice

This Executive Order mandates that each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions. Federal agency responsibilities under this Executive Order include conducting their programs, policies, and activities that substantially affect human health or the environment, in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons from participation in, denying persons the benefit of, or subjecting persons to discrimination under, such programs, policies and activities, because of their race, color, or national origin. Furthermore, each federal agency responsibility set forth under this Executive Order shall apply equally to Native American programs.

Specifically, federal agencies shall, to the maximum extent practicable: conduct human health and environmental research and analysis; collect human health and environmental data; collect, maintain, and analyze information on the consumption patterns of those who principally rely on fish and/or wildlife for subsistence; allow for public participation and access to information relating to the incorporation of environmental justice principals in Federal agency programs or policies; and share information and eliminate unnecessary

duplication of efforts through the use of existing data systems and cooperative agreements among Federal agencies and with State, local, and tribal governments.

8 Other Applicable Law

8.1 Administrative Procedure Act

All federal rulemaking is governed under the provisions of the Administrative Procedures Act (APA) (5 U.S.C. Subchapter II), which establishes a "notice and comment" procedure to enable public participation in the rulemaking process. Under the APA, NMFS is required to publish notification of proposed rules in the Federal Register and to solicit, consider and respond to public comment on those rules before they are finalized. The APA also establishes a 30-day wait period from the time a final rule is published until it takes effect, with some exceptions. This amendment complies with the provisions of the APA through the Council's extensive use of public meetings, requests for comments and consideration of comments. The proposed rule associated with this amendment will have request for public comments which complies with the APA.

8.2 Information Quality Act

The Information Quality Act (Section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Public Law 106-443)) which took effect October 1, 2002, directed the Office of Management and Budget (OMB) to issue government-wide guidelines that "provide policy and procedural guidelines to federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information disseminated by federal agencies." OMB directed each federal agency to issue its own guidelines, establish administrative mechanisms allowing affected persons to seek and obtain correction of information that does not comply with OMB guidelines, and report periodically to OMB on the number and nature of complaints.

The NOAA Section 515 Information Quality Guidelines require a series of actions for each new information product subject to the Information Quality Act. This document has used the best available information and made a broad presentation thereof. The process of public review of this document provides an opportunity for comment and challenge to this information, as well as for the provision of additional information.

The information contained in this document was developed using best available scientific information. Therefore, this Amendment and EIS are in compliance with the IQA.

8.3 Coastal Zone Management Act

Section 307(c)(1) of the federal Coastal Zone Management Act (CZMA) of 1972 requires that all federal activities that directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. While it is the goal of the South Atlantic Council to have management measures that complement those of the states, Federal and state administrative procedures vary and regulatory changes are unlikely to be fully instituted at the same time. Based on the analysis of the environmental consequences of the proposed action in Section 4.0, the Council has concluded this amendment would improve Federal management of deepwater coral ecosystems.

The Council believes this amendment is consistent to the maximum extent practicable with the Coastal Zone Management Plans of Florida, Georgia, South Carolina, and North Carolina. This determination will be submitted to the responsible state agencies under Section 307 of the CZMA administering approved Coastal Zone Management Programs in the States of Florida, South Carolina, Georgia, and North Carolina.

8.4 Endangered Species Act

The Endangered Species Act (ESA) of 1973 (16 U.S.C. Section 1531 et seq.) requires that federal agencies must ensure actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of threatened or endangered species or the habitat designated as critical to their survival and recovery. The ESA requires NOAA Fisheries Service to consult with the appropriate administrative agency (itself for most marine species, and the U.S. Fish and Wildlife Service for all remaining species) when proposing an action that may affect threatened or endangered species or adversely modify critical habitat. Consultations are necessary to determine the potential impacts of the proposed action. They are concluded informally when proposed actions may affect but are "not likely to adversely affect" threatened or endangered species or designated critical habitat. Formal consultations, resulting in a biological opinion, are required when proposed actions may affect and are "likely to adversely affect" threatened or endangered species or adversely modify designated critical habitat. There have been no known interactions between the golden crab fishery and endangered species in the South Atlantic region and due to the nature of the fishing activity any interactions are expected to be minimal.

8.5 Executive Order 12612: Federalism

E.O. 12612 requires agencies to be guided by the fundamental federalism principles when formulating and implementing policies that have federalism implications. The purpose of the Order is to guarantee the division of governmental responsibilities between the Federal government and the States, as intended by the framers of the Constitution. No federalism issues have been identified relative to the actions proposed in this amendment and associated regulations. Therefore, preparation of a Federalism assessment under E.O. 13132 is not necessary.

8.6 Executive Order 12866: Regulatory Planning and Review

E.O. 12866, signed in 1993, requires federal agencies to assess the costs and benefits of their proposed regulations, including distributional impacts, and to select alternatives that maximize net benefits to society. To comply with E.O. 12866, NMFS prepares a Regulatory Impact Review (RIR) for all fishery regulatory actions that implement a new FMP or that significantly amend an existing plan. RIRs provide a comprehensive analysis of the costs and benefits to society associated with proposed regulatory actions, the problems and policy objectives prompting the regulatory proposals, and the major alternatives that could be used to solve the problems. The reviews also serve as the basis for the agency's determinations as to whether proposed regulations are a "significant regulatory action" under the criteria provided in E.O. 12866 and whether proposed regulations will have a significant economic impact on a substantial number of small entities in compliance with the RFA. A regulation is significant if it is likely to result in an annual effect on the economy of at least $100,000,000 or if it has other major economic effects.

In accordance with E.O. 12866, the following is set forth by the Council: (1) this rule is not likely to have an annual effect on the economy of more than $100 million or to adversely affect in a material way the economy, a sector of the economy, productivity, jobs, the environment, public health or safety, or state, local, or tribal governments or communities; (2) this rule is not likely to create any serious inconsistencies or otherwise interfere with any action take or planned by another agency; (3) this rule is not likely to materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights or obligations of recipients thereof; (4) this rule is not likely to raise novel or policy issues arising out of legal mandates, or the principles set forth in the Executive Order; (5) this rule is not controversial.

8.7 Executive Order 12898: Environmental Justice

E.O. 12898 requires that "to the greatest extent practicable and permitted by law…each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority populations and low-income populations in the United States and its territories and possessions…"

The alternatives being considered in this amendment are not expected to result in any disproportionate adverse human health or environmental effects to minority populations or low-income populations of Florida, North Carolina, South Carolina or Georgia, rather the impacts would be spread across all participants in the golden crab and shrimp fisheries participants regardless of race or income.

8.8 Executive Order 12962: Recreational Fisheries

E.O. 12962 requires Federal agencies, in cooperation with States and Tribes, to improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities through a variety of methods including, but not limited to, developing joint partnerships; promoting the restoration of recreational fishing areas that are limited by water quality and habitat degradation; fostering sound aquatic conservation and restoration endeavors; and evaluating the effects of Federally-funded, permitted, or authorized actions on aquatic systems and evaluating the effects of Federally-funded, permitted, or authorized actions on aquatic systems and recreational fisheries, and documenting those effects. Additionally, the order establishes a seven member National Recreational Fisheries Coordination Council responsible for, among other things, ensuring that social and economic values of healthy aquatic systems that support recreational fisheries are considered by Federal agencies in the course of their actions, sharing the latest resource information and management technologies, and reducing duplicative and cost-inefficient programs among Federal agencies involved in conserving or managing recreational fisheries. The Council also is responsible for developing, in cooperation with Federal agencies, States and Tribes, a Recreational Fishery Resource Conservation Plan - to include a five-year agenda. Finally, the Order requires NMFS and the U.S. Fish and Wildlife Service to develop a joint agency policy for administering the ESA.

The alternatives considered in this amendment are consistent with the directives of E.O. 12962.

8.9 Executive Order 13089: Coral Reef Protection

E.O. 13089, signed by President William Clinton on June 11, 1998, recognizes the ecological, social, and economic values provided by the Nation's coral reefs and ensures that Federal agencies are protecting these ecosystems. More specifically, the Order requires Federal agencies to identify actions that may harm U.S. coral reef ecosystems, to utilize their program and authorities to protect and enhance the conditions of such ecosystems, and to ensure that their actions do not degrade the condition of the coral reef ecosystem.

The alternatives considered in this amendment are consistent with the directives of E.O. 13089.

8.10 Executive Order 13158: Marine Protected Areas

E. O. 13158 was signed on May 26, 2000 to strengthen the protection of U.S. ocean and coastal resources through the use of Marine Protected Areas (MPAs). The E.O. defined MPAs as "any area of the marine environment that has been reserved by Federal, State, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein." It directs federal agencies to work closely with state, local and non-governmental partners to create a comprehensive network of MPAs "representing diverse U.S. marine ecosystems, and the Nation's natural and cultural resources".

The alternatives considered in this amendment are consistent with the directives of E.O. 13158.

8.11 Marine Mammal Protection Act

The MMPA established a moratorium, with certain exceptions, on the taking of marine mammals in U.S. waters and by U.S. citizens on the high seas. It also prohibits the importing of marine mammals and marine mammal products into the United States. Under the MMPA, the Secretary of Commerce (authority delegated to NOAA Fisheries Service) is responsible for the conservation and management of cetaceans and pinnipeds (other than walruses). The Secretary of the Interior is responsible for walruses, sea otters, polar bears, manatees, and dugongs.

Part of the responsibility that NOAA Fisheries Service has under the MMPA involves monitoring populations of marine mammals to make sure that they stay at optimum levels. If a population falls below its optimum level, it is designated as "depleted." A conservation plan is then developed to guide research and management actions to restore the population to healthy levels.

In 1994, Congress amended the MMPA, to govern the taking of marine mammals incidental to commercial fishing operations. This amendment required the preparation of stock assessments for all marine mammal stocks in waters under U.S. jurisdiction; development and implementation of take-reduction plans for stocks that may be reduced or are being

maintained below their optimum sustainable population levels due to interactions with commercial fisheries; and studies of pinniped-fishery interactions. The MMPA requires a commercial fishery to be placed in one of three categories, based on the relative frequency of incidental serious injuries and mortalities of marine mammals. Category I designates fisheries with frequent serious injuries and mortalities incidental to commercial fishing; Category II designates fisheries with occasional serious injuries and mortalities; Category III designates fisheries with a remote likelihood or no known serious injuries or mortalities.

Under the MMPA, to legally fish in a Category I and/or II fishery, a fisherman must take certain steps. For example, owners of vessels or gear engaging in a Category I or II fishery, are required to obtain a marine mammal authorization by registering with the Marine Mammal Authorization Program (50 CFR 229.4). They are also required to accommodate an observer if requested (50 CFR 229.7(c)) and they must comply with any applicable take reduction plans.

The golden crab fishery in the South Atlantic is listed as a Category III fishery in the 2009 Proposed List of Fisheries (LOF)(73 FR 33760; June 13, 2008). No incidentally killed or injured marine mammal species has been documented in this fishery.

The rock shrimp fishery and royal red shrimp fishery are listed as Category III fisheries in the 2009 Proposed List of Fisheries (LOF)(73 FR 33760; June 13, 2008). No incidentally killed or injured marine mammal species have been documented in these fisheries.

8.12 Migratory Bird Treaty Act and Executive Order 13186

The Migratory Bird Treaty Act (MBTA) implemented several bilateral treaties for bird conservation between the United States and Great Britain, the United States and Mexico, the United States and Japan, and the United States and the former Union of Soviet Socialists Republics. Under the MBTA, it is unlawful to pursue, hunt, take, capture, kill, possess, trade, or transport any migratory bird, or any part, nest, or egg of a migratory bird, included in treaties between the, except as permitted by regulations issued by the Department of the Interior (16 U.S.C. 703-712). Violations of the MBTA carry criminal penalties. Any equipment and means of transportation used in activities in violation of the MBTA may be seized by the United States government and, upon conviction, must be forfeited to it.

Executive Order 13186 directs each federal agency taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations to develop and implement a memorandum of understanding (MOU) with the U.S. Fish and Wildlife Service (USFWS) to conserve those bird populations. In the instance of unintentional take of migratory birds, NOAA Fisheries Service would develop and use principles, standards, and practices that will lessen the amount of unintentional take in cooperation with the USFWS. Additionally, the MOU would ensure that NEPA analyses evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern.

An MOU is currently being developed, which will address the incidental take of migratory birds in commercial fisheries under the jurisdiction of NOAA Fisheries Service. NOAA Fisheries Service must monitor, report, and take steps to reduce the incidental take of

seabirds that occurs in fishing operations. The United States has already developed the U.S. National Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries. Under that plan many potential MOU components are already being implemented.

The alternatives considered in this amendment are consistent with the directives of E.O. 13186.

8.13 National Environmental Policy Act

This amendment to the Councils' Coral FMP and the Golden Crab FMP has been written and organized in a manner that meets NEPA requirements, and thus is a consolidated NEPA document, including a final Environmental Impact Statement, as described in NOAA Administrative Order (NAO) 216-6, Section 6.03.a.2.

Purpose and Need for Action
The purpose and need for this action are described in **Section 1.1.**

Alternatives
The alternatives for this action are described in **Section 2.0.**

Affected Environment
The affected environment is described in **Section 3.0**.

Impacts of the Alternatives
The impacts of the alternatives on the environment are described in **Section 4.0.**

8.14 National Marine Sanctuaries Act

Under the National Marine Sanctuaries Act (NMSA) (also known as Title III of the Marine Protection, Research and Sanctuaries Act of 1972), as amended, the U.S. Secretary of Commerce is authorized to designate National Marine Sanctuaries to protect distinctive natural and cultural resources whose protection and beneficial use requires comprehensive planning and management. The National Marine Sanctuary Program is administered by the Sanctuaries and Reserves Division of the NOAA. The Act provides authority for comprehensive and coordinated conservation and management of these marine areas. The National Marine Sanctuary Program currently comprises 13 sanctuaries around the country, including sites in American Samoa and Hawaii. These sites include significant coral reef and kelp forest habitats, and breeding and feeding grounds of whales, sea lions, sharks, and sea turtles. The two main sanctuaries in the South Atlantic EEZ are Gray's Reef and Florida Keys National Marine Sanctuaries.

The alternatives considered by this document are not expected to have any adverse impacts on the resources managed by the Gray's Reef and Florida Keys National Marine Sanctuaries.

8.15 Paperwork Reduction Act

The purpose of the Paperwork Reduction Act (PRA) is to minimize the burden on the public. The Act is intended to ensure that the information collected under the proposed action is needed and is collected in an efficient manner (44 U.S.C. 3501 (1)). The authority to manage

information collection and record keeping requirements is vested with the Director of the Office of Management and Budget (OMB). This authority encompasses establishment of guidelines and policies, approval of information collection requests, and reduction of paperwork burdens and duplications. The PRA requires NMFS to obtain approval from the OMB before requesting most types of fishery information from the public.

The VMS requirements proposed in this amendment would establish an electronic data collection system. Additional data collection requirements would be associated with registering the VMS unit with NMFS and/or arranging installation of a VMS unit on a vessel. If VMS for the golden crab fishery is selected as a preferred alternative, NMFS will submit a request for approval of the data collection to the OMB for review under the Paperwork Reduction Act.

8.16 Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) of 1980 (5 U.S.C. 601 et seq.) requires Federal agencies to assess the impacts of regulatory actions implemented through notice and comment rulemaking procedures on small businesses, small organizations, and small governmental entities, with the goal of minimizing adverse impacts of burdensome regulations and record-keeping requirements on those entities. Under the RFA, NMFS must determine whether a proposed fishery regulation would have a significant economic impact on a substantial number of small entities. If not, a certification to this effect must be prepared and submitted to the Chief Counsel for Advocacy of the Small Business Administration. Alternatively, if a regulation is determined to significantly impact a substantial number of small entities, the Act requires the agency to prepare an initial and final Regulatory Flexibility Analysis to accompany the proposed and final rule, respectively. These analyses, which describe the type and number of small businesses, affected, the nature and size of the impacts, and alternatives that minimize these impacts while accomplishing stated objectives, must be published in the Federal Register in full or in summary for public comment and submitted to the chief counsel for advocacy of the Small Business Administration. Changes to the RFA in June 1996 enable small entities to seek court review of an agency's compliance with the Act's provisions.

This amendment document includes an Initial Regulatory Flexibility Analysis (IRFA) in **Section 6.0**.

8.17 Small Business Act

Enacted in 1953, the Small Business Act requires that agencies assist and protect small-business interests to the extent possible to preserve free competitive enterprise. The objectives of the act are to foster business ownership by individuals who are both socially and economically disadvantaged; and to promote the competitive viability of such firms by providing business development assistance including, but not limited to, management and technical assistance, access to capital and other forms of financial assistance, business training, and counseling, and access to sole source and limited competition federal contract opportunities, to help firms achieve competitive viability. Because most businesses associated with fishing are considered small businesses, NMFS, in implementing regulations, must make an assessment of how those regulations will affect small businesses.

8.18 Public Law 99-659: Vessel Safety

Public Law 99-659 amended the MSFCMA to require that a FMP or FMP amendment must consider, and may provide for, temporary adjustments (after consultation with the U.S. Coast Guard and persons utilizing the fishery) regarding access to a fishery for vessels that would be otherwise prevented from participating in the fishery because of safety concerns related to weather or to other ocean conditions.

No vessel would be forced to participate in South Atlantic fisheries under adverse weather or ocean conditions as a result of the imposition of management regulations proposed in this amendment.

No concerns have been raised by South Atlantic fishermen or by the U.S. Coast Guard that the proposed management measures directly or indirectly pose a hazard to crew or vessel safety under adverse weather or ocean conditions. Therefore, this amendment proposes neither procedures for making management adjustments due to vessel safety problems nor procedures to monitor, evaluate, or report on the effects of management measures on vessel or crew safety under adverse weather or ocean conditions.

9 List of Preparers

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Myra Brouwer	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
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Interagency CE-BA 1 Planning Team/Reviewers

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

Responsible Agency

Amendment:

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Environmental Impact Statement:

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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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12 Index

Acropora, *3-11*, *3-12*, 3-15, 3-16, 11-1, 11-9
Actions and Alternatives, 2-1
Administrative Effects, 7-1
Affected Environment, 3-1
Biological Effects, xiii, 7-1
bycatch, 1-3, 3-14, *4-42*
Bycatch Practicability Analysis, *4-42*
Chaceon fenneri, *4-31*
Comparison of Alternatives, 2-1, 2-2, 2-3
Cumulative Effects, i, *4-37*, 11-2
Deepwater Corals, 3-5
Deepwater Shrimp, 10-1
Economic Effects, xiii, xiv, 7-1
EFH, i, 1-3, *3-4*, 3-5, 4-19, 4-20, 4-21, 4-22, 4-23, 4-24, 4-25, 4-26, 4-27, 4-28, 4-29, 4-30, 4-31, *4-32*, *4-33*, *4-35*, *4-36*, 9-1
elkhorn, 3-12, 3-16
Endangered Species, i, 3-11, 3-15, *4-44*, 8-2
Environmental Consequences, 4-19
Fishery Impact Statement, 7-1
golden crab, 3-16, 4-31, *4-38*, 8-3, 8-5, 8-7, 11-9
Golden Crab, 4-31, 8-6, 10-1, 11-6, 11-7
Habitat, *3-1*
Habitat Area of Particular Concern, i, 1-3, 4-28
HAPC, i, 1-3, 4-27, 4-28, 4-29, 4-30, 4-31, *4-32*, *4-34*, *4-35*, *4-36*, *4-38*
History of Management, *1-2*
Human Environment, *3-19*
Initial Regulatory Flexibility Analysis, 6-1
Management Objectives, *1-1*
Monitoring and Mitigation Measures, *4-44*
National Environmental Policy Act, ii, *4-37*, 8-6, 11-2
NEPA, ii, *4-37*, 7-1, 8-5, 8-6, 9-1
Purpose and Need, *1-1*
Regulatory Impact Review, 5-1
rock shrimp, 1-3, 4-26, 4-28, 8-5
smalltooth sawfish, 3-15, 11-1, 11-8
Social Effects, xiii, xiv, *4-44*, 7-1
Species Most Impacted by this Amendment, 3-5
staghorn, 3-12, 3-15, 3-16
Summary, xiii
Unavoidable Adverse Effects, *4-44*
wreckfish, 3-4, 4-28, 4-29