AMENDMENT 6 TO THE FISHERY MANAGEMENT PLAN FOR THE GOLDEN CRAB FISHERY OF THE SOUTH ATLANTIC REGION

January 2012

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

National Marine Fisheries Service
Southeast Regional Office
263 13th Avenue South
St. Petersburg, Florida 33701
(727) 824-5301 / FAX (727) 824-5308

This is a publication of the South Atlantic Fishery Management Council pursuant to National Oceanic and Atmospheric Administration Award No. NA05NMF4410004

ABBREVIATIONS AND ACRONYMS

ABC	Acceptable Biological Catch
ACCSP	Atlantic Coastal Cooperative Statistics Program
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
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
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

AMENDMENT 6 TO THE FISHERY MANAGEMENT PLAN FOR THE GOLDEN CRAB FISHERY OF THE SOUTH ATLANTIC REGION

INCLUDING A DRAFT ENVIRONMENTAL ASSESSMENT, INITIAL REGULATORY FLEXIBILITY ANALYSIS, DRAFT REGULATORY IMPACT REVIEW, AND DRAFT SOCIAL IMPACT ASSESSMENT/FISHERY IMPACT STATEMENT

Proposed actions:

For golden crab, implement a catch share program with measures to define eligibility and allocate shares; define excessive shares; designate a cost recovery program, monitoring and enforcement, use or lose provision, and set-aside for borrowing and for new entrants; establish criteria for transferability.

Lead agency:

FMP Amendments – South Atlantic Fishery Management Council
EA- NOAA Fisheries Service

For Further Information Contact:

Robert K. Mahood
4055 Faber Place, Suite 201
North Charleston, SC 29405
843-571-4366
843-769-4520 (fax)
866-SAFMC-10
Robert.mahood@safmc.net

Roy E. Crabtree, Ph.D.
NOAA Fisheries Service, Southeast Region
263 13th Avenue South
St. Petersburg, FL 33701
727-824-5301
727-824-5320 (fax)

NOI:
Scoping meetings held: JANUARY-FEBRUARY 2011
Public Hearings Held: TO BE FILLED IN

ABSTRACT

The need for action through Amendment 6 to the Fishery Management Plan for the Golden Crab Fishery of the South Atlantic Region (Amendment 6) is to implement a Catch Share or Limited Access Privilege program for the South Atlantic golden crab fishery. More specifically, the actions proposed in Amendment 6 would:

- Implement a catch share program for golden crab. These management measures could include:
    - Identify eligibility requirements for initial allocation of privileges to fish a portion of the annual catch limit (ACL);
    - Allocate privileges to fish a portion of the ACL to individual entities and define criteria for transferability;
    - Establish a cap on ownership of privileges;
    - Designate a set-aside for new entrants and for borrowing;
    - Implement a use or lose provision;
    - Devise a method for recovery of the costs of administering, monitoring, and enforcing management of the golden crab fishery.

The Draft Environmental Assessment analyzes the effects of implementing the proposed actions listed above.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

TABLE OF CONTENTS
FOR THE ENVIRONMENTAL ASSESSMENT

1 Introduction

1.1 Purpose and Need

Amendment 6 to the Fishery Management Plan (FMP) for the Golden Crab Fishery of the South Atlantic Region (Golden Crab FMP) consists of regulatory actions that focus on the development of a catch share program for the golden crab fishery. Currently, the fishery for golden crab is limited entry and has had a low level of participation. The fishery operates near several deepwater coral habitats of particular concern, which were developed to protect sensitive deepwater coral ecosystems. The level of experience needed to fish near but not among the deepwater coral reefs is quite high and a catch share program is expected to limit participation in the golden crab fishery to those with a high level of experience in the fishery.

A catch share program would also allow current fishery participants the ability to enhance their at-sea storage systems and develop new markets for the golden crab products.

Management actions proposed in this amendment include:

- Implement a catch share program for golden crab. Management measures being considered include:
    - Identify eligibility requirements for initial allocation of privileges to fish a portion of the annual catch limit (ACL);
    - Allocate privileges to fish a portion of the ACL to individual entities and define criteria for transferability;
    - Establish a cap on ownership of privileges;
    - Designate a set-aside for new entrants and for borrowing;
    - Implement a use or lose provision;
    - Devise a method for recovery of the costs of administering, monitoring, and enforcing management of the golden crab fishery.

1.2 Management Objectives

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

1. Prevent overfishing of golden crab by preventing the fishing mortality rate from exceeding the fishing mortality rate that would produce maximum sustainable yield (F_{msy});
2. Promote orderly utilization of the resource;
3. Provide for a flexible management system that minimizes regulatory delays while retaining substantial South Atlantic Fishery Management Council (Council) and public involvement in management decisions, and rapidly adapts to changes in resource abundance, new scientific information, and changes in fishing patterns among user groups;

4. Develop a mechanism to vest fishermen in the golden crab fishery, and create incentives for conservation and regulatory compliance whereby fishermen can realize potential long-run benefits from efforts to conserve and manage the golden crab resource;
5. Provide a management regime that promotes stability and facilitates long-range planning and investment by harvesters and dealers while avoiding, where possible, the necessity for more stringent management measures and increasing management costs over time;
6. Develop a mechanism that allows the marketplace to drive harvest strategies and product forms in order to maintain product continuity and increase total producer and consumer benefits from the fishery;
7. Promote management regimes that minimize gear and area conflicts among fishermen;
8. Minimize tendency for over-capitalization in the harvesting and processing/distribution sectors;
9. Provide a reasonable opportunity for fishermen to make adequate returns from commercial fishing by controlling entry so that returns are not regularly dissipated by open access, while also providing avenues for fishermen not initially included in the controlled access program to enter the program.

1.3 History of Management

The following is a summary of management actions for the Golden Crab FMP. 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 the Golden Crab Fishery of the South Atlantic Region

The golden crab resource and fishery in the South Atlantic Region was unprotected prior to implementation of the FMP. The Council approved a control date that was published in the *Federal Register* on April 7, 1995. The Council completed the Golden Crab FMP (SAFMC 1995) and submitted the plan for formal Secretarial Review on December 15, 1995. Regulations implementing the FMP were published in the *Federal Register* on August 27, 1996 [61 Federal Register 43952]; various regulations became effective August 27, September 26, and October 28, 1996, and September 7, 1997.

The Golden Crab FMP relies on a system of traditional fishery management plus controlled access. Traditional fisheries management includes measures to provide biological protection to the resource (escape gaps in traps and no retention of female crabs); gear regulation (define allowable gear, degradable panel, tending requirements, gear identification, and maximum trap size by zone); provide for law enforcement (depth limitations and prohibit possession of whole fish or fillets of snapper grouper species); determine the number of participants (vessel and dealer/processor permits); collect the necessary data (vessel/fishermen and dealer/processor reporting); and a framework procedure to adjust the management program (framework adjustments and adjustments to activities authorized by the Secretary of Commerce). Use of these traditional management techniques in other fishery management plans has not solved all fisheries

management problems. At best, the fishery resource, in this case golden crab, is biologically protected. Ignored or even exacerbated are underlying social and economic problems resulting from gear conflicts, high regulatory costs, and low marketing incentives. To solve these social and economic problems, managers have increasingly turned to various forms of controlled access or effort limitation. The Council chose to limit the number of vessels in the golden crab fishery. Combining the more traditional fisheries management measures with controlled access best allowed the Council to solve problems in the golden crab fishery.

Framework Seasonal Adjustment #1 (SAFMC 1997) revised the vessel size limitations applicable when a vessel permit is transferred to another vessel and extended through December 31, 2000, the authorization to use wire cable for a mainline attached to a golden crab trap. The framework document was sent to NOAA Fisheries Service on September 26, 1997, and the proposed rule was published on June 26, 1998. The final rule was published in the *Federal Register* on October 28, 1998, with regulations effective upon publication.

Amendment 1 to the Golden Crab FMP (SAFMC 1998b) was a part of the Council's Comprehensive Habitat Amendment addressing Essential Fish Habitat in FMPs of the South Atlantic Region. Essential fish habitat for golden crab includes the U.S. Continental Shelf from Chesapeake Bay south through the Florida Straits, and into the Gulf of Mexico. In addition, the Gulf Stream, which occurs within the exclusive economic zone, is essential fish habitat because it provides a mechanism to disperse golden crab larvae. The detailed description of seven essential fish habitat types (a flat foraminferan ooze habitat; distinct mounds, primarily of dead coral; ripple habitat; dunes; black pebble habitat; low outcrop; and soft-bioturbated habitat) for golden crab is provided in Wenner *et al.* (1987). Refer to **Section 4.0** in this Amendment, Volume II of the Fishery Ecosystem Plan (SAFMC 2009b) and the Habitat Plan (SAFMC 1998a) for a more detailed description of habitat utilized by the managed species. There is insufficient knowledge of the biology of golden crabs to identify spawning and nursery areas and to identify habitat of particular concern (HAPCs). As information becomes available, the Council would evaluate such data and identify HAPCs as appropriate through the framework. In addition, Amendment 1 established a framework procedure to address habitat issues; this framework was added to the framework of all approved FMPs including the Golden Crab FMP. Amendment 1 was submitted to the NOAA Fisheries Service on October 9, 1998. The Notice of Availability was published in the *Federal Register* on March 5, 1999, and the Comprehensive Habitat Amendment was approved on June 3, 1999. The proposed rule was published on July 9, 1999, and a supplement to the proposed rule was published on November 2, 1999. The final rule was published in the *Federal Register* on June 14, 2000, with regulations becoming effective July 14, 2000.

Amendment 2 (SAFMC 1998c) to the Golden Crab FMP was a part of the Council's Comprehensive Amendment addressing Sustainable Fishery Act definitions and other required provisions in FMPs of the South Atlantic Region. The amendment was partially approved on May 19, 1999. The final rule was published in the *Federal Register* on

November 2, 1999, with regulations becoming effective December 2, 1999. The description of fisheries and communities was approved and bycatch reporting was approved. The remaining items for golden crab were disapproved because "the stock status determination criteria are incomplete and, thus, do not totally fulfill the new requirements of the Magnuson-Stevens Act and the national standard guidelines."

Amendment 3 to the Golden Crab FMP (SAFMC 2000) extended the authorization to use wire cable for mainlines attached to golden crab traps to December, 31, 2002; modified escape panel sizes for traps; addressed permit renewal requirements including removal of the 5,000-pound harvest requirement for renewing biannual permits and addressed the minimum harvest requirement for permit holders in the southern zone; allowed up to a 20% increase in vessel size from the vessel size of the original permit; created a sub-zone within the southern zone with specified conditions; allowed two new vessels to be permitted to fish only in the northern zone using an earlier list of those wanting to enter the fishery; specified status determination criteria; and modified the FMP framework to allow modifications to the sub-zone.

Lastly, the current effort at managing the golden crab fishery is distinguished by the practice of co-management, which has been defined by McGoodwin (1990) as "a shift away from autocratic and paternalistic modes of management to modes that rely on the joint efforts of traditional fisheries specialists and fishing peoples." The options for managing the fishery that are put forth in this document have been developed by the golden crab fishermen and refined in consultation with the Council. It is hoped that such efforts would increase the legitimacy of the future regulations and make the rationale for such regulations more understandable to all involved.

Amendment 4 to the Golden Crab FMP, included in the Comprehensive Ecosystem-Based Amendment 1 (SAFMC 2009b), established allowable golden crab fishing areas that allow fishermen to harvest golden crab in two of the Coral HAPCs. One area is in the Northern Zone (north of 28 degrees N. latitude), three are in the Middle Zone (between 28 degrees N. latitude and 25 degrees N. latitude), where fishery activity is concentrated; and one area is in the Southern Zone (south of 25 degrees N. latitude).

Amendment 5 to the Golden Cran FMP (Amendment 5), included in the Comprehensive ACL Amendment (SAFMC 2011) established an ACL for golden crab at a level of 2 million pounds. Amendment 5 also implemented accountability measures if the ACL is reached.

2 Actions and Alternatives

This section outlines the proposed actions and alternatives considered by the South Atlantic Fishery Management Council (Council). A complete analysis of these alternatives can be found in **Section 4.0.**

Alternatives the Council considered during the development of Amendment 6 to the Fishery Management Plan for the Golden Crab Fishery of the South Atlantic Region and/or presented at the first round of public hearings but eliminated from further detailed study are described in **Appendix A**.

2.1 Action 1. Establish eligibility criteria for a golden crab catch share program

Alternative 1. No Action. Do not establish eligibility criteria for a golden crab catch share program.

Alternative 2. Restrict eligibility to valid commercial golden crab permit holders who have made landings of 1 pound or greater from 2001 through 2010.

Alternative 3. Restrict eligibility to valid commercial golden crab permit holders who have made landings of 1 pound or greater from 2005 through 2010.

Preferred Alternative 4. Restrict eligibility to valid commercial golden crab permit holders. Eligibility for participation in this catch share program is defined as having a valid commercial golden crab permit as of the control date of 12/7/2010.

Selection of Alternatives

2.1.1 Comparison of Alternatives

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

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Biological				
Economic				
Social				
Administrative				

2.1.2 Conclusion

2.2 Action 2. Initial apportionment of catch shares

Alternative 1. No action. Do not specify a method for initial apportionment of catch shares.

Alternative 2. Distribute initial catch shares proportionately among eligible participants based on the aggregate annual golden crab landings from logbooks associated with their current permit(s) during the time period 2002 through 2010.

Alternative 3. Distribute initial catch shares proportionately among eligible participants based on the aggregate annual golden crab landings from logbooks associated with their current permit(s) during the time period 1997 through 2010.

Alternative 4. Distribute 50% of initial catch shares equally among eligible participants and distribute 50% of initial catch shares among eligible participants based on the aggregate annual golden crab landings from logbooks associated with their current permit(s) during the time period 1997 through 2010.

Sub-alternative 4a. To receive catch shares distributed equally among eligible participants, aggregate golden crab logbook landings from 1997 through 2010 associated with an eligible participant's current permit must equal or exceed 25,000 pounds.

Sub-alternative 4b. To receive catch shares distributed equally among eligible participants, aggregate golden crab logbook landings from 1997 through 2010 associated with an eligible participant's current permit must equal or exceed 50,000 pounds.

Alternative 5. Distribute 25% of initial catch shares equally among eligible participants and distribute 75% of initial catch shares among eligible participants based on the aggregate annual golden crab landings from logbooks associated with their current permit(s) during the time period 1997 through 2010.

Sub-alternative 5a. To receive catch shares distributed equally among eligible participants, aggregate golden crab logbook landings from 1997 through 2010 associated with an eligible participant's current permit must equal or exceed 25,000 pounds.

Sub-alternative 5b. To receive catch shares distributed equally among eligible participants, aggregate golden crab logbook landings from 1997 through 2010 associated with an eligible participant's current permit must equal or exceed 50,000 pounds.

Alternative 6. Distribute initial catch shares proportionately among eligible participants based on the best consecutive three year average of golden crab logbook landings associated with their current permit(s) during the time period 1997 through 2010.

Note: the pounds requirement sub-alternatives for **Alternative 6** are recommended to be dropped because they made reference to distributing shares equally among participants, however, **Alternative 6** refers to proportional distribution. So, if the Council wants to have minimum amount of landings to qualify for proportional distribution, the Council should clarify and develop revised sub-alternatives.

2.2.1 Comparison of Alternatives

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

	Alternative 1	Alternative 2	Alternative 3	Alternative 4a	Alternative 4b
Biological					
Economic					
Social					
Administrative					

Table 2-2 continued

	Alternative 5a	Alternative 5b	Alternative 6
Biological			
Economic			
Social			
Administrative			

2.2.2 Conclusion

2.3 Action 3. Establish criteria and structure of an appeals process

Alternative 1. No Action. Do not specify provisions for an appeals process.

Alternative 2. A percentage of the golden crab shares for the initial fishing year under the program will be set-aside to resolve appeals for a period of 90-days starting on the effective date of the final rule. The Regional Administrator (RA) will review, evaluate, and render final decisions on appeals. Hardship arguments will not be considered. The RA will determine the outcome of appeals based on NMFS' logbooks. If NMFS' logbooks are not available, the RA may use state landings records. Appellants must submit NMFS' logbooks or state landings records to support their appeal. After the appeals process has been terminated, any amount remaining from the set-aside will be distributed back to remaining shareholders according to the redistribution method selected under Action 2.

Preferred Sub-alternative 2a: Three percent of golden crab shares will be set aside for appeals.
Sub-alternative 2b: Five percent of golden crab shares will be set aside for appeals.
Sub-alternative 2c: Ten percent of golden crab shares will be set aside for appeals.
Sub-alternative 2d: Two percent of golden crab shares will be set aside for appeals.

Selection of Alternatives

2.3.1 Comparison of Alternatives

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

	Alternative 1	Alternative 2a	Alternative 2b	Alternative 2c
Biological				
Economic				
Social				
Administrative				

2.3.2 Conclusion

2.4 Action 4. Establish criteria for transferability

Alternative 1. No Action. Do not establish criteria for transferability

Alternative 2. Shares or annual pounds can only be transferred to golden crab permit holders.

Alternative 3. Shares or annual pounds can only be transferred to golden crab permit holders during the first five years of the catch share program and all U.S. citizens and permanent resident aliens thereafter.

Selection of Alternatives

2.4.1 Comparison of Alternatives

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

	Alternative 1	Alternative 2	Alternative 3

Biological			
Economic			
Social			
Administrative			

2.4.2 Conclusion

2.5 Action 5. Define quota share ownership caps

Alternative 1. No Action. Do not constrain the percentage of catch shares held by a person, including a corporation or other entity

Alternative 2. No person, including a corporation or other entity, may individually or collectively hold catch shares in excess of the maximum share initially issued to any person at the beginning of the catch share program,

Alternative 3. No person, including a corporation or other entity, may individually or collectively hold catch shares in excess of 25 percent of the total shares.

Alternative 4. No person, including a corporation or other entity, may individually or collectively hold catch shares in excess of 35 percent of the total shares.

Preferred Alternative 5. No person, including a corporation or other entity, may individually or collectively hold catch shares in excess of 49 percent of the total shares.

Note: For the purposes of considering the share cap, an individual's total catch share is determined by adding the applicable catch shares held by the individual and the applicable catch shares equivalent to the corporate share the individual holds in a corporation. A corporation's total catch share is determined by adding the applicable catch shares held by the corporation and any other individual transferable quota shares held by a corporation(s) owned by the original corporation prorated based on the level of ownership.

Selection of Alternatives

2.5.1 Comparison of Alternatives

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

	Alternative 1	**Alternative 2**	**Alternative 3**	**Alternative 4**	**Alternative 5**

Biological					
Economic					
Social					
Administrative					

2.5.2 Conclusion

2.6 Action 6. Use it or Lose it policy

Alternative 1. No Action. Do not specify a minimum landings requirement for retaining shares.

Alternative 2. Shares that remain inactive for 3 CONSECUTIVE years will be revoked and redistributed proportionally among the remaining shareholders. "Inactive" is defined as less than 10% of the aggregate annual average utilization of the catch share quota over a 3 year moving average period"

Sub-alternative 2a. Landed crabs only.

Sub-alternative 2b. Landed crabs and/or transfer of annual pounds

Alternative 3. Shares that remain inactive for 3 CONSECUTIVE years will be revoked and redistributed proportionally among the remaining shareholders. "Inactive" is defined as less than 30% of the aggregate annual average utilization of the catch share quota over a 3 year moving average period"

Sub-alternative 3a. Landed crabs only.

Sub-alternative 3b. Landed crabs and/or transfer of annual pounds.

Selection of Alternatives

2.6.1 Comparison of Alternatives

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

	Alternative 1	Alternative 2a	Alternative 2b	Alternative 3a	Alternative 3b
Biological					
Economic					
Social					

Administrative					

2.6.2 Conclusion

2.7 Action 7. Cost recovery plan

Alternative 1. No Action. Do not implement a cost recovery plan.

Alternative 2. Alternative 2. Cost recovery fees would be calculated at time of sale at a registered dealer.

Sub-alternative 2a: Cost recovery fees would be based on actual ex-vessel value of landings,

Preferred Sub-alternative 2b: Cost recovery fees would be based on standard ex-vessel value of landings, as calculated by NMFS.

Alternative 3: Fee collection and submission shall be the responsibility of:

Sub-alternative 3a: Shareholder

Preferred Sub-alternative 3B: Dealer

Alternative 4: Fees submitted to NMFS

Preferred Sub-alternative 4a: Quarterly

Sub-alternative 4b: Monthly

Sub-alternative 4c: Annually

Selection of Alternatives

2.7.1 Comparison of Alternatives

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

	Alternative 1	Alternative 2a	Alternative 2b	Alternative 3a	Alternative 3b
Biological					
Economic					
Social					
Administrative					

Table 2-7. (continued)

	Alternative 4a	Alternative 4b
Biological		
Economic		

Social		
Administrative		

2.7.2 Conclusion

2.8 Action 8. Establish boat length limit rule

Alternative 1. No Action. To obtain a permit for the middle or southern zone via transfer, the documented length overall of the replacement vessel may not exceed the documented length overall, or aggregate documented lengths overall, of the replaced vessel(s) by more than 20 percent.

Alternative 2. Eliminate vessel length restrictions for obtaining a permit for the middle and southern zones via transfer.

Selection of Alternatives

2.8.1 Comparison of Alternatives

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

	Alternative 1	Alternative 2
Biological		
Economic		
Social		
Administrative		

2.8.2 Conclusion

2.9 Action 9. Restrictions on where permitted vessels can fish for golden crab

Alternative 1. No Action. A vessel with a permit to fish for golden crab in the northern zone or the middle zone may fish only in that zone. No vessel with a documented length overall greater than 65 ft (19.8 m) may fish for golden crab in the small vessel sub-zone within the southern zone. The small vessel subzone is bounded on the north by 24°15' N. lat., on the south by 24°07' N. lat., on the east by 81°22' W. long., and on the west by 81°56' W. long. Upon request from an owner of a permitted vessel, the NMFS Regional Administrator will change the zone specified on a permit from the middle or southern zone to the northern zone. A vessel may possess golden crab only in a zone in which it is authorized to fish, except that other zones may be transited if the vessel notifies NMFS Office for Law Enforcement in advance and does not fish in a zone in which it is not authorized to fish.

Alternative 2. Participants can use quota in any zone for which they possess a permit.

Alternative 3. A vessel with a permit to fish golden crab can use annual pounds in any of the three golden crab fishing zones.

2.9.1 Comparison of Alternatives

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

	Alternative 1	Alternative 2	Alternative 3
Biological			
Economic			
Social			
Administrative			

2.9.2 Conclusion

2.10 Action 10. Modify the small vessel sub-zone restriction

Alternative 1. No Action. Do not eliminate the small vessel sub-zone within the southern zone that was originally established to protect against very large vessels fishing in the subzone

Alternative 2. Eliminate the small vessel sub-zone within the southern zone that was originally established to protect against very large vessels fishing in the subzone.

Selection of Alternatives

2.10.1 Comparison of Alternatives

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

	Alternative 1	Alternative 2
Biological		
Economic		
Social		
Administrative		

2.10.2 Conclusion

2.11 Action 11. Establish criteria for permit stacking

Alternative 1. No Action. Do not allow stacking of permits.

Alternative 2. Allow for stacking of up to three permits on one vessel so that any zones for which the vessel has a permit can be fished in one trip.

Alternative 3. Allow an unlimited amount of golden crab permits on a single vessel so that any zones for which the vessel has a permit can be fished in one trip.

Selection of Alternatives

2.11.1 Comparison of Alternatives

Table 2-11. Summarized comparison of the impacts among alternatives for Action 11.

	Alternative 1	Alternative 2	Alternative 3
Biological			
Economic			
Social			
Administrative			

2.11.2 Conclusion

2.12 Action 12. Monitoring and enforcement

NOTE: Council may consider a hail-in/hail out requirement that would require fishermen to call in before and after their fishing trips to better monitor the catch share program.

Alternative 1. No Action. Do not require additional monitoring and enforcement.

Alternative 2. Require all fishing vessels permitted in the golden crab catch share program to be equipped with VMS. The purchase, installation, and maintenance of VMS equipment must conform to the protocol established by NMFS in the Federal Register.

Sub-alternative 2a. The purchase, installation, and maintenance of the VMS equipment and communications costs will be paid for or arranged by the shareholder.
Sub-alternative 2b. The purchase of the VMS equipment will be paid for by NMFS and the installation, maintenance, and communications costs of the VMS equipment will be paid for or arranged by the shareholder.
Sub-alternative 2c. The purchase of VMS equipment will be reimbursed by the National OLE VMS reimbursement account if funding is available. Installation, maintenance, and communication costs will be paid for or arranged by the shareholder.

Note: The Council may want to consider **i**mplementing a hail-in requirement (at least 3 hrs ahead of time whereby a message could be left or texted in excess of 3 hours) when landing with location and time or other information deemed necessary by enforcement.

Selection of Alternatives

2.12.1 Comparison of Alternatives

Table 2-12. Summarized comparison of the impacts among alternatives for Action 12.

	Alternative 1	Alternative 2a	Alternative 2b	Alternative 2c
Biological				
Economic				
Social				
Administrative				

2.12.2 Conclusion

2.13 Action 13. Establish criteria for new entrants program

Alternative 1. No Action. Do not create provisions that assist new entrants in entering the fishery.

Alternative 2. Set aside some amount of annual pounds for new entrants when quota is: (i) released as a part of a violation, (ii) lost quota (use it or lose it provision); and (iii) when the ACL exceeds 3 million pounds (Golden Crab AP).

Alternative 3. Set aside 2% of the golden crab ACL each year to be auctioned off to permit holders that do not possess shares.

Alternative 4. Set aside 5% of the golden crab ACL each year to be auctioned off to permit holders that do not possess shares.

Alternative 5. Set aside 10% of the golden crab ACL each year to be auctioned off to permit holders that do not possess shares.

Selection of Alternatives

2.13.1 Comparison of Alternatives

Table 2-13. Summarized comparison of the impacts among alternatives for Action 13.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Biological					
Economic					
Social					
Administrative					

2.13.2 Conclusion

2.14 Action 14. Annual pounds overage

Alternative 1. No Action. Do not allow fishermen to exceed their annual pounds.

Alternative 2. A person on board a vessel with the shareholder's only remaining golden crab allocation may exceed, by up to 10%, the shareholder's annual pounds remaining on the last fishing trip of the year. Shareholders who incur an overage will be required to payback the overage in the subsequent year of their allocation.

Alternative 3. A person on board a vessel with the shareholder's only remaining golden crab allocation may exceed, by up to 20%, the shareholder's annual pounds remaining on the last

fishing trip of the year. Shareholders who incur an overage will be required to payback the overage in the subsequent year of their allocation.

Selection of Alternatives

2.14.1 Comparison of Alternatives

Table 2-14. Summarized comparison of the impacts among alternatives for Action 14.

	Alternative 1	Alternative 2	Alternative 3
Biological			
Economic			
Social			
Administrative			

2.14.2 Conclusion

2.15 Action 15. Approved landing sites

Alternative 1. No Action. Do not establish approved landing sites for the golden crab catch share program.

Alternative 2. Establish approved landing sites for the golden crab catch share program. All participants must land at one of these sites to participate in the program.

Preferred Sub-alternative 2a. Approved landing sites will be selected by fishermen but must be approved by NMFS Office of Law Enforcement (OLE) in consultation with the appropriate state law enforcement agency prior to use.

Sub-alternative 2b. Approved landings sites will be selected by the Council and NMFS in consultation with the appropriate state law enforcement agency, based on industry recommendations and resource availability.

Selection of Alternatives

2.15.1 Comparison of Alternatives

Table 2-15. Summarized comparison of the impacts among alternatives for Action 15.

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

2.15.2 Conclusion

3 Affected Environment

3.1 Habitat

3.1.1 Description and distribution

Wenner et al. (1987) note: "Other studies have described an association of *Geryon quinquedens* (deep-sea red crab) with soft substrates. Wigley et al. (1975) noted that bottom sediments throughout the area surveyed for red crab from offshore Maryland to Corsair Canyon (Georges Bank) consisted of a soft, olive-green, silt-clay mixture. If golden crabs preferentially inhabit soft substrates, then their zone of maximum abundance may be limited within the South Atlantic Bight. Surveys by Bullis and Rathjen (1959) indicated that green mud occurred consistently at 270-450 meters between St. Augustine and Cape Canaveral, FL (30°N and 28°N). This same depth range from Savannah, GA, to St. Augustine was generally characterized by Bullis and Rathjen (1959) as extremely irregular bottom with some smooth limestone or "slab" rock present. Our study indicates, however, that the bottom due east between Savannah and St. Catherine's Island, GA, at 270-540 meters consists of mud and biogenic ooze. Further north from Cape Fear, NC, to Savannah, bottom topography between 270 and 450 m is highly variable with rocky outcrops, sand and mud ooze present (Low and Ulrich 1983)."

In a subsequent study using a submersible, Wenner and Barans (1990) found the greatest abundance in rock outcrops:

"Observations on density and a characterization of essential habitat for golden crab, *Chaceon fenneri*, were made from a submersible along 85 transects in depths of 389-567 meters approximately 122 kilometers southeast of Charleston, South Carolina. Additional observations on habitat were made on 16 transects that crossed isobaths between 293-517 meters.

Seven essential habitat types can be identified for golden crab from observations:

- A flat foraminiferan ooze habitat (405-567 meters) was the most frequently encountered habitat. This habitat type is characterized by pteropod-foraminiferan debris mixed with larger shell fragments, a sediment surface mostly covered with a black phosphorite precipitate.

- Distinct mounds, primarily of dead coral at depths of 503 to 555 meters, constituted 20% of the bottom surveyed on dives to count crabs. Coral mounds rose approximately 15 to 23 meters in height above the surrounding sea floor and included several that were thinly veneered with a fine sediment and dead coral fragments, as well as a number that were thickly encrusted with live branching ahermatypic corals (*Lophelia prolifera* and *Enallopsammia profunda*). Fan-shaped sponges, pennatulids and crinoids were oriented into the northerly 1.4-1.9 kilometer per hour current. The decapod crustaceans *Bathynectes longispina*, *Eugonatonotus crassus* and *Eumunida picta*, the black-bellied rosefish, *Helicolenus dactylopterus*, and the wreckfish, *Polyprion americanus*, were frequently sighted along transects in the coral mound habitat.

- Ripple habitat (320-539 meters); dunes (389-472 meters); black pebble habitat (446-564 meters); low outcrop (466-512 meters); and soft-bioturbated habitat (293-475 meters). A total of 109 *C. fenneri* were sighted within the 583,480 m^2 of bottom surveyed. Density (mean no. per 1,000 m^2) was significantly different among habitats, with highest values (0.7 per 1,000 m^2) noted among low rock outcrops. Lowest densities were observed in the dune habitat (<0.1 per 1,000 m^2), while densities for other habitats were similar (0.15-0.22 per 1,000 m^2)."

A similar submersible study in the eastern Gulf of Mexico (Lindberg and Lockhart 1993) found similar results with higher abundance of golden crab on hardbottom: "Within the bathymetric range of golden crabs, crab abundance may be related more to habitat type than to depth. The greatest density (36.5 crabs/hectare) occurred on or near hard-bottom canyon features."

Golden crabs occupy offshore oceanic waters along the Atlantic and Gulf of Mexico coasts as adults. Offshore areas used by adults are probably the least affected by habitat alterations and water quality degradation. Currently, the primary threat comes from oil and gas development and production, offshore dumping of dredged material, disposal of chemical and other wastes, and the discharge of contaminants by river systems.

3.1.2 Essential Fish Habitat

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

Refer to Section 3.0 in the Habitat Plan (SAFMC 1998) for a more detailed description of habitat utilized by the managed species. Also, it should be noted that the Gulf Stream occurs within the exclusive economic zone (EEZ).

Essential Fish Habitat-Habitat Areas of Particular Concern (HAPC)

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

3.2 Biological/Ecological Environment

3.2.1 Species Most Impacted by this Amendment

3.2.1.1 Golden Crab

The golden crab, *Chaceon fenneri* (**Figure 3-1**), is a large gold or buff colored species whose diagnostic characters include a hexagonal carapace; five anterolateral teeth on each side of carapace; well-developed, large frontal teeth; shallow, rounded orbits; chelipeds unequal; and the dactyli of the walking legs laterally compressed (Manning and Holthuis 1984, 1986). Golden crabs inhabit the continental slope of Bermuda (Luckhurst 1986, Manning and Holthuis 1986)

and the southeastern U.S. from off Chesapeake Bay (Schroeder 1959), south through the Straits of Florida and into the eastern Gulf of Mexico (Manning and Holthuis 1984, 1986; Otwell *et al.* 1984; Wenner *et al.* 1987; Erdman 1990).

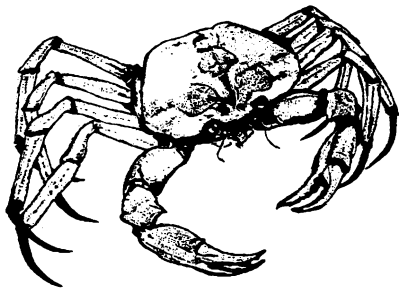


Figure 3-1. Golden Crab, *Chaceon fenneri*

Reported depth distributions of *C. fenneri* range from 205 meters (672 feet) off the Dry Tortugas (Manning and Holthuis 1984) to 1,007 meters (3,304 feet) (off Bermuda (Manning and Holthuis 1986). Size of males examined ranged from 34 to 139 millimeters (1.3-5.5 inches) carapace length (CL) and females ranged from 39 to 118 millimeters (1.5-4.6 inches) CL. Ovigerous females have been reported during September, October, and November, and ranged in size from 91 to 118 millimeters (3.6-4.6 inches) CL (Manning and Holthuis 1984, 1986).

Reproduction

Reproduction and anatomy of the reproductive tracts of males and females of the golden crab were studied by Hinsch (1988) in specimens collected from deep water of the eastern Gulf of Mexico:

"The male crab is larger than the female. Their reproductive tracts are typical of brachyurans. Light and electron microscopic studies of the testes and vasa deferentia at various times during the year indicate that *C. fenneri* has a single reproductive season. Spermatogenesis begins in the fall. Mating occurs during March and April. The reproductive organs of males are reduced in size from May through September.

The fully developed ovary of golden crabs is purple in color. Females oviposit in September and October. Females undergo vitellogenesis at the same time that they carry eggs undergoing embryonic development. Females with broods have ovaries which vary in color and size. They release their larvae during February and March. Females may be reproductive for several seasons and appear to be capable of mating while in the hardened condition"

Development, growth and movement patterns

Wenner et al. (1987) found in the South Atlantic Bight that: "Size-related distribution of *C. fenneri* with depth, similar to that reported for red crab, may occur in the South Atlantic Bight. We found the largest crabs in the shallowest (274-366 m) and deepest (733-823 m) strata. A clear trend of size-related up-slope migrations such as Wigley et al. (1975) reported for *C. quinquedens* (deep-sea red crab) is not apparent, however, because of trap bias for capture of larger crabs of both sexes. Otwell et al. (1984) also noted no pattern in size of golden crab by

depth for either sex. Tagging studies of red crab off southern New England provided no evidence for migration patterns and indicated instead that tagged crabs seldom moved more than 20 km from their site of release (Lux et al. 1982)."

Lindberg and Lockhart (1993) found in the Gulf of Mexico:
"The golden crab *Chaceon fenneri* in the eastern Gulf of Mexico exhibits a typical bathymetric pattern of partial sex zonation and an inverse size-depth relationship, as first reported for red crabs (*C. quinquedens*: Wigley et al., 1975; *C. maritae*: Beyers and Wilke, 1980). Sex segregation, with females shallower than most males, was more evident in our results than in those of Wenner et al. (1987) from the South Atlantic Bight, primarily because our trap catch had a higher proportion of females (25.9% compared to 5.2%)."

Ecological relationships
Feeding habits are very poorly known. Golden crabs are often categorized as scavengers that feed opportunistically on dead carcasses deposited on the bottom from overlying waters (Hines 1990).

Abundance and status of stocks
Golden crab abundance studies are limited. Data from the South Atlantic Bight (Wenner et al. 1987) estimated abundance from visual assessment was 1.9 crabs per hectare while traps caught between 2 and 10 kilograms (4-22 pounds) per trap. Wenner and Barans (1990) estimated the golden crab population in small areas of 26-29 square kilometers (10-11 square miles) between 300-500 meters (984-1,640 feet) off Charleston to be 5,000-6,000 adult crabs. In the eastern Gulf of Mexico adult standing stock was estimated to be 7.8 million golden crabs and the biomass was estimated to be 6.16 million kilograms (13.6 million pounds) (Lindberg *et al.* 1989). Experimental trapping off Georgia yielded an average catch of 7 kilograms (15 pounds) per trap (Kendall 1990).

Based on exploratory trapping, golden crab maximum abundance occurs between 367 and 549 meters (1,204-1,801 feet) in the South Atlantic Bight. Information on sediment composition suggests that golden crab abundance is influenced by sediment type with highest catches on substrates containing a mixture of silt-clay and foraminiferan shell (Wenner et al. 1987).

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
<u>Endangered</u>

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 spp. 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 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 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 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*
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.

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

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 (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 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 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 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.

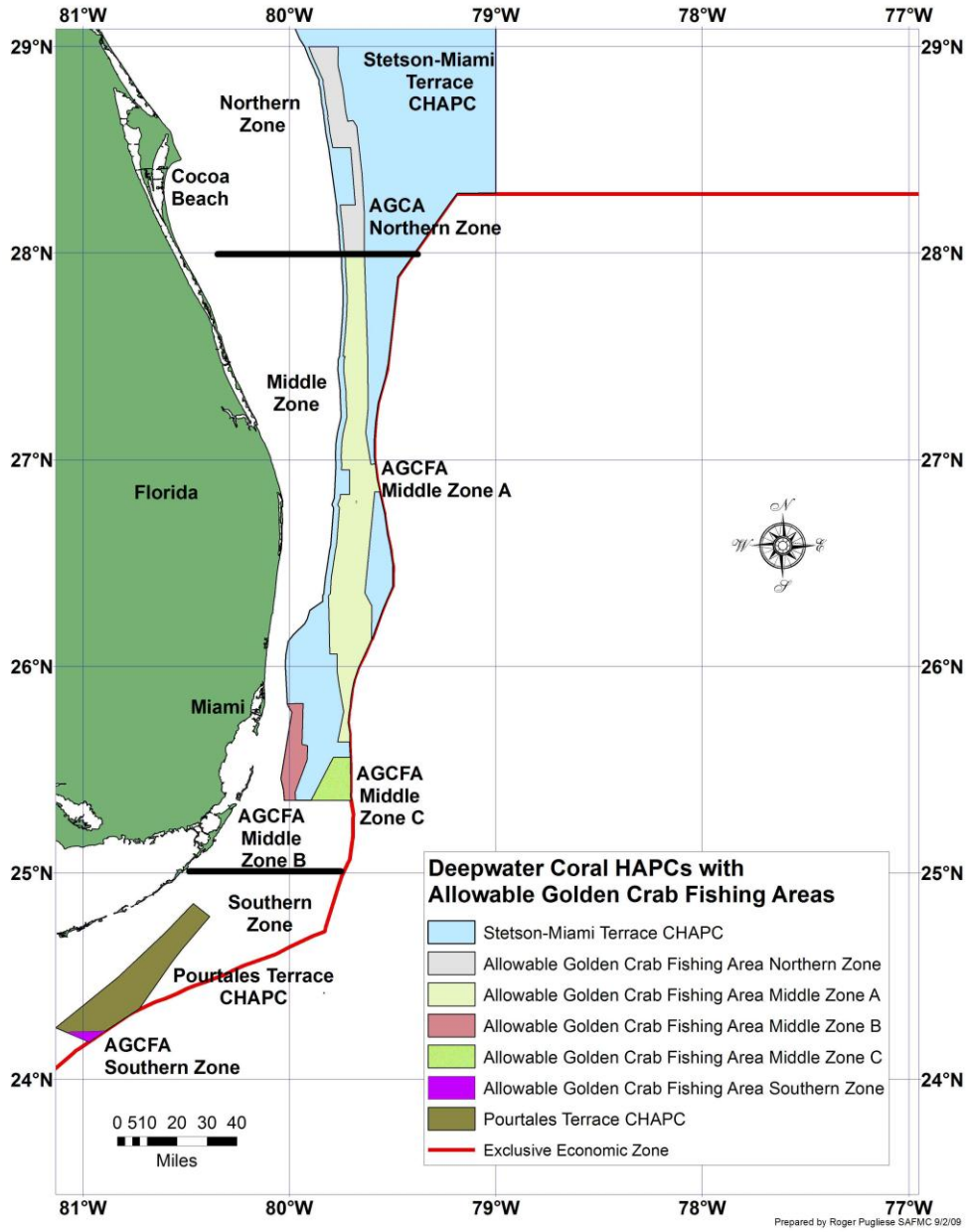
3.4 Human Environment

3.4.1 Golden Crab Fishery

3.4.1.1 Description of Harvest Methods, Gear, and Zones

Fishing Zones

The Golden Crab FMP established three golden crab fishing zones (Figure 3.2). The Northern Zone is defined as being that portion of the South Atlantic EEZ north of 28^0 N (to the North Carolina-Virginia border). The Middle Zone is contained within the EEZ between 25^0 N and 28^0 N. The Southern Zone extends south from 25^0 N within the South Atlantic EEZ.



Harvest Methods

The description below was summarized from observations recorded by Council staff (Gregg Waugh, pers. communication) on a commercial golden crab fishing trip aboard the *Lady Mary*, the fishing vessel belonging to the Nielsen family. Additional information was obtained during the course of presentations by fishermen at the April 1995 Council meeting, the 2008 Golden Crab Advisory Panel meeting and a meeting that took place in October 2008 among golden crab fishermen, Council and NOAA Fisheries Service staffs, and NOAA Office of Law Enforcement.

The golden crab fishery employs baited traps attached with gangions to a 5/8" polypropylene line up to 8 kilometers (5 miles) long. There are 20 to 50 traps per line, or "trawl," set 152 meters (500 feet) apart. Fishermen may fish 4 trawls in a two-week period pulling 100 traps one week and 100 the next (Howard Rau, pers. communication). In 2008, vessels in the golden crab fishery averaged 17 meters (57 feet) in length (Golden Crab AP, 2008)

A typical trip to fish for golden crabs begins with the vessel leaving the dock at 3:00 a.m. Bait wells to be placed in the traps are prepared on the way out. The bait consists of available fish heads and racks (cod, snapper, grouper, dolphin, mackerel or any other available fish), chicken parts, pigs' feet, etc. Four and a half hours after leaving dock, the vessel is on site and the crew ready to begin the process of picking up traps and deploying new ones. When the traps are retrieved, the empty bait container is removed and a full one is put in place. It was estimated that at least 65 tons of bait were being used in this fishery at the time this description was compiled.

Trawls are set south to north with the current in areas of soft mud adjacent to deepwater coral habitat. However, due to the strong currents the string of traps may settle on the seabed up to one and a half miles away, east or west, from the vessel. The location of deployment is noted using GPS; buoys are not used to mark the location of traps due to strong currents. Retrieval begins at the south end of the trawl. To begin retrieval, the main line, which may be sitting 305 meters (1,000 feet) below, must be grappled. The success of this operation depends on currents and sea conditions. Also, fishermen must note the conditions during trap deployment in order to predict how far the traps may have moved and where the traps will be located relative to their GPS coordinates. Some vessels rely on their depth finders to locate the gear on the bottom. At different times of the year, when the current is not as swift and is moving in a favorable direction, it is easier to place the grapple on the bottom. The grapple consists of links of large chain and is used to hook the main line towards one end of the string. On the observed trip, the grapple did not appear to have disturbed the bottom. Sometimes, however, the grapple or the trap itself may have mud adhered to it when it is pulled out of the water.

Once the grapple successfully hooks the main line, the line is pulled up and looped over the pulley allowing crew members to pull over to the first trap on the line. Traps are stacked on deck as the string is worked toward the short end of the line. Upon reaching one end of the line, the vessel turns around to work the string toward the other end. It takes approximately two hours to work a string of traps. The determining factor for how long a day of fishing will last is how quickly each trap string can be grappled. Sometimes it is necessary to move traps up or down the slope, keeping the same latitude and moving in a range of 8 to 24 kilometers (5-15 miles) east or west in order to avoid hardbottom or to follow the crabs. After a soak period, traps may be moved as described depending on the success of the catch. Nine to 13 kilograms (20-30 pounds) of crabs per trap is a desirable catch. On a good season, fishermen may catch 32 to 45 kilograms (70-100 pounds) per trap.

Golden crab traps have two entrances, one on the top and one on the bottom. As each trap is brought on deck, the empty bait wells are replaced with full ones. A spike coming up from the bottom of the frame holds the bait well in place. The trap string is deployed off the stern. The end of the string is weighted and its position recorded using GPS.

Towards the stern of the vessel is a spacious ice hold. As the traps are retrieved and brought on deck, golden crabs are removed by hand. The crabs are immediately placed into plastic boxes or coolers and layered with ice. As each crab is removed from the trap, a crew member checks its size (weight) and sex. All females and individuals weighing less than 1 ¼ pounds are released back into the water. Only male crabs are harvested because, since the beginning of this fishery, fishermen felt that an integral factor in the sustainable harvest of this resource was not to harvest the females. Besides, females are smaller than males and therefore less marketable.

On the observed trip, three trawls were retrieved (about 100 traps) out of which only 20-25 crabs were discarded. Such a low number of crabs are released upon trap retrieval because the majority of the culling is being accomplished through the escape panels while the traps are still submerged. Thus, escape gaps are very effective in culling out undersized individuals.

Detailed Trap Description

The modern golden crab traps are constructed of 3/8" smooth rebar. The latter makes it easier to place the stainless steel hog rings on it to hold the wire in place. The trap is 1.2 meters (4 feet) long, 76 centimeters (30 inches) wide and 46 centimeters (18 inches) high. The body of the trap consists of 1" x 2" mesh and 14 gauge galvanized wire with plastic coating. The corners of the trap are reinforced with zinc to prevent the wire from falling off. The zinc reinforcements are replaced every four or five months as they wear out. At the time this description was compiled (1995), golden crab traps cost about $100 to construct. A golden crab trap weighs approximately 30 pounds.

The trap has two funnels through which the crabs enter the trap. Initially one entrance funnel was placed in the center of the trap. However, fishermen soon realized that traps sometimes landed on the bottom upside down thus preventing the crabs' from entering the trap. The only crabs that would then have access to the bait would be the smaller ones that could enter through the escape gaps. Fishermen then designed the traps with two funnels on opposite sides of the trap that were offset to either side. That way, if the trap landed in such a way as to cover up one of the funnels, it would still be able to fish through the other.

Degradable wire is used to lock the traps. To open the trap, the wire is simply cut. Since the main trap door is shut using degradable wire, ghost fishing is not a concern if the trap becomes lost. In addition, traps are required to have two escape gaps on either side of the trap to allow females and small individuals to escape.

Allowable gear

Traps are the only allowable gear in the golden crab fishery. Rope is the only allowable material for mainlines and buoy line. Maximum trap size is 1.8 cubic meters (64 cubic feet) in volume in the Northern zone and 1.4 cubic meters (48 cubic feet) in volume in the Middle and Southern zones. Traps must have at least 2 escape gaps or rings and an escape panel. Traps must be identified with a permit number.

3.4.1.1 Bycatch

[inset bycatch info for golden crab fishery]

3.4.2 Economic Description

3.4.2.1 Economic Description

Data and Methods

Commercial fishing for golden crab is described in 1995-2010 at the fishery, vessel and trip levels using NMFS, SEFSC Florida Trip Ticket (FTT), Golden Crab Logbook (LKB), and Accumulated Landings System (ALS) data bases.[2] The data are shown in whole weight (ww), and 2010 dollars (2010$), referring to the dollar amount paid to fishermen by dealers (first buyers).[3] FTT and LBK data are used in vessel and trip summaries (LBK with ALS dollar values added).[4] Fishermen landed golden crab in the early 1980s (Golden Crab FMP, 1995, Section 3.5); official collection of mostly confidential began in 1986.[5] Because of the small number of participants, fishing activity of high liner vessels may contribute to fluctuations in indicator variables, and proxies are used for landings and ex-vessel value for 2005.[6]

Golden Crab Commercial Fishing

Allowing for differences among data sources, landings of golden crab ranged from 0.5 to 1.7 million pounds (ww) in 1995-2010, and averaged 0.491 mp in 2006-2010, with an ex-vessel value of $871,000 (Figure 3.4.1 and Table 3.4.1, FTT). The total vessel gross revenue is $913,000 for all species landed by the same vessels, albeit for separate trips, areas of capture,

[2]The data used for analysis are NMFS, SEFSC managed: Florida Trip Ticket (FTT) System (1986-1996, 19Mar10, and 1997-2011, 02Sep11); LBK (1995-96, 26Aug10, and 1997-2010, 02Jun11); and Accumulated Landings System (ALS) (03Feb11). For all LBK data and some FTT data, dollar values are added. For early FTT data, the initial step is as follows: [ex-vessel value = landed weight * price]. If dollar values for 1986-1996 are still missing, they are estimated [ex-vessel value = ALS price (ww) * FTT pounds (ww)], where [FTT pounds (ww) = landed weight * conversion factor], and [ALS ex-vessel price (ww) = ALS ex-vessel value / ALS pounds (ww)]. ALS data are used sequentially starting with file merges in SAS by species, year, month and state.

[3]To offset the effects of general price inflation in the U.S. economy over time, a "deflator" is used to translate "current" dollars into 2010 dollars by month (U.S. Bureau of Labor Statistics, BLS, index for producer prices, all commodities, not seasonally adjusted).

[4]The FTT data include the U.S. Coast Guard or state-assigned VESIDs for the most part for 1997 onward. The Saltwater Products License number (SPL) is used in the place of the VESID for 1986-1996, and for some other years (1997, 12 of 225 trips; 1998, 32 of 139 trips; 2002, 3 of 278 trips; and 2004, 5 of 176 trips).

[5]There are for fewer than three dealers for South Carolina in 1987, 1995, and 1996; the Florida west coast (NMFS state code 11) in 1993, 2000, 2003, and 2005 onward; and for the Florida non-coastal counties (NMFS state code 12) in 1994 and 1995. Data may have been included inseparably in aggregates for several species.

[6]The number of vessels associated with each small business entity is estimated by year. Quoting SBA: "Individuals or firms that have identical (or substantially identical) business or economic interests may be treated as though they are affiliated. Family members, persons with common investments, or firms that are economically dependent through contractual (or other) relationships, are among those treated this way" (13 C.F.R. § 121.103(f)). Permit-LBK data are used, courtesy of Andy Strelcheck (22Sep10 & 03Jun11), based on work by Janet L. Miller, NMFS, SERO, and Kevin McCarthy, Michael Judge, and David Gloeckner, NMFS, SEFSC.

and/or gear (Table 3.4.1). The ex-vessel value for golden crab alone is virtually the same as total trip gross, because little if anything else is reported for the trips. Besides golden crab, the $913,000 total includes $71,000 for stone crab, $26,400 for spiny lobster, and $1,334 for other species (FTT). Species other than golden crab were more important in the past, accounting for half of the $2.2-million total for vessel gross in 1996-2000. This indicates a change for the "fleet" of vessels, not necessarily a counterpart change for each vessel. Ex-vessel prices of golden crab in 2010 dollars exhibited a mostly upward trend during 1995-2010, and they averaged $1.77 / lb in 2006-2010 (Table 3.4.1 and Figure 3.4.1).

Table 3.4.1. Golden crab commercial fishing (FTT).

		Vessel gross, 2010$ * 10^3		Golden crab						
Year	Ves-sels	Total	Per vessel	Thsnd lbs (ww)	Thsnd 2010$	2010$ / lb	Lbs / vessel	Trips	Lbs / trip	2010$ / trip
1995	15			1,738	$2,471	$1.42	115,840	481	3,612	$5,138
1996	7	$2,127	$304	830	$1,006	$1.21	118,616	150	5,535	$6,703
1997	14	$3,406	$243	1,032	$1,295	$1.25	73,727	225	4,587	$5,754
1998	9	$1,999	$222	425	$567	$1.34	47,199	139	3,056	$4,082
1999	6	$1,337	$223	834	$1,247	$1.50	138,963	183	4,556	$6,814
2000	11	$2,349	$214	934	$1,502	$1.61	84,875	301	3,102	$4,989
2001	9	$1,782	$198	764	$1,265	$1.66	84,834	331	2,307	$3,821
2002	13	$1,169	$90	516	$907	$1.76	39,680	278	1,856	$3,261
2003	6	$600	$100	332	$587	$1.77	55,388	180	1,846	$3,263
2004	6	$570	$95	312	$553	$1.77	51,987	176	1,772	$3,142
2005	7	$762	$109	392	$732	$1.86	55,992	313	1,252	$2,337
2006	6	$955	$159	416	$910	$1.78	69,325	331	1,257	$2,750
2007	4	$700	$175	440	$699	$1.59	109,989	321	1,371	$2,177
2008	4	$761	$190	494	$759	$1.54	123,443	244	2,024	$3,110
2009	5	$1,147	$229	549	$1,007	$1.83	109,843	291	1,887	$3,459
2010	4	$1,001	$250	557	$979	$1.76	139,247	338	1,648	$2,896
Five-year averages. Vessel, trip and price averages based on data in rows.										
96-00	9	$2,244	$239	811	$1,123	$1.39	86,270	200	4,063	$5,628
01-05	8	$976	$119	463	$809	$1.75	56,477	256	1,812	$3,164
06-10	5	$913	$198	491	$871	$1.77	106,777	305	1,610	$2,855

Source: NMFS, SEFSC, Florida Trip Ticket (FTT), and US BLS, PPI. The pound and dollar totals for 2005 are estimated. The numbers of vessels for 1995-1998, 2002 and 2004 are estimate using available data to link SPLs with VESIDs.

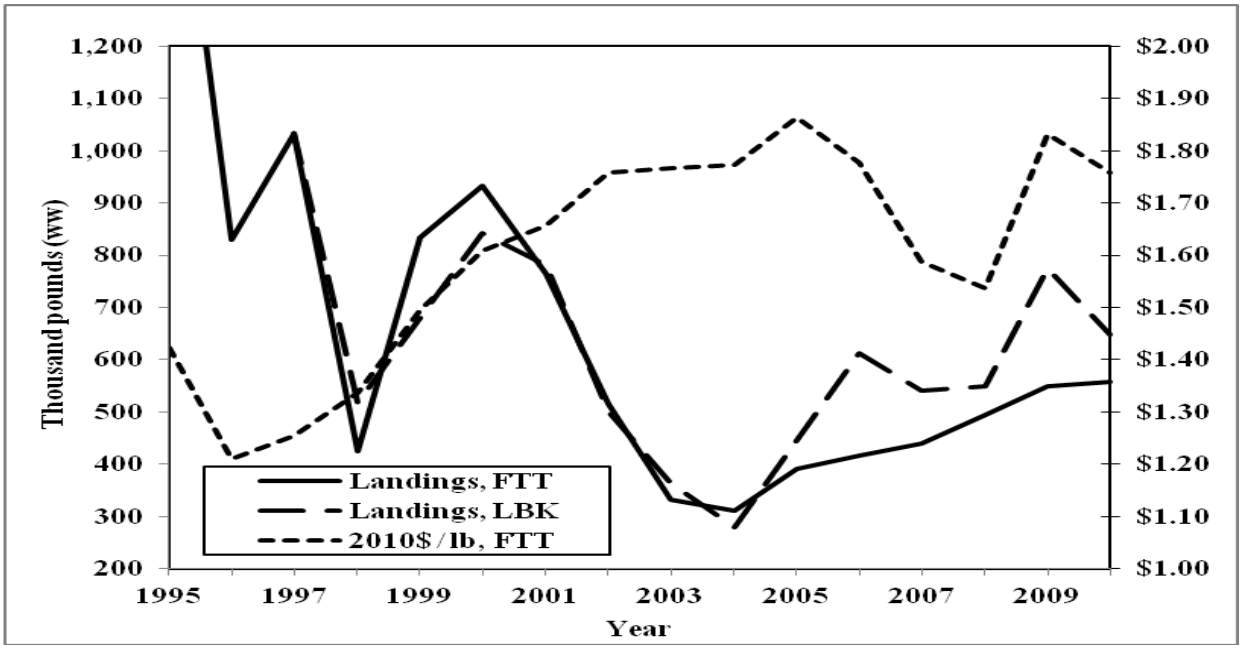


Figure 3.4.1. Golden crab, landings and ex-vessel prices (vertical axes do not start at zero).

If an independently owned and operated vessel is to continue fishing over time, its gross revenue must cover its operating costs, such as docking fees, insurance, permits, and repairs (vessel, engine, and traps), as well as trip costs (Shivlani et al., 2005, Tables 20-22, survey data for the early 2000s for vessels fishing mostly for spiny lobster and stone crab, and some golden crab). Information on vessels, and cost and returns is contained in the Golden Crab FMP, 1995, Section 3.5. A cost-and-returns survey is planned (Scott Crosson, NMFS, SEFSC). Vessels averaged 107,000 pounds of golden crab, and $198,000 in gross revenue (for all species, not just golden crab) in 2006-2010, compared with 86,000 pounds of golden crab, and $239,000 in gross revenue in 1996-2000. The increase in landings per vessel of golden crab and higher prices were not enough to offset the loss in revenue for other species (Table 3.4.1). There was a good deal of variability in gross revenue during 1995-2010, from approximately $10,000 or less per vessel to $400,000 or more. Vessel gross revenue cannot be computed using LBK data, but it is needed to describe vessel economic activity, and for the RFA analysis. Vessels landing golden crab averaged approximately 42-62 feet in length, and engines averaged 432-743 horsepower (NMFS, SERO, permits data, 1997-2006; more complete information on vessels obtained in public hearings is provided in the FMP, 1995, Section 3.7, Tables 6-7).

There are some caveats for data summaries. The Fishery Management Plan for the Golden Crab Fishery of the South Atlantic Region (Golden Crab FMP) is for the South Atlantic EEZ; it has a permit-based limited-access system, with permits that may be specific to fishing zones (50 CFR § 622.4 (a) (2) (x); 50 CFR § 622.17). Today, there are 11 permitted vessels, 5 vessels on average with landings in 2006-2010, and fewer than 3 small business entities with landings in 2005 (Tables 3.4.1-3.4.3; "Data and Methods" in this section).[7] Under proposed regulations in Amendment 6 for a catch share program, more permit applicant data may become available to

[7]Other numbers for participants are shown in "Overview," SAFMC Golden Crab Committee, March 3, 2009, Jekyll Island Club Hotel, 371 Riverview Drive, Jekyll Island, GA.

assess confidentiality issues, which are more likely by zone than by year.[8] Meanwhile, landings by zone are not shown in this section.

Table 3.4.2. Golden crab commercial fishing (LBK).

Year	Ves-sels	Lbs * 10^3	2010$ * 10^3	Lbs / vessel	Trips	Lbs / trip	2010$ / trip	Days fished	Traps	Depth fished
1997	11	1,034	$1,371	94,041	245	4,222	$5,595	345	27,703	1,377
1998	9	518	$743	57,591	156	3,323	$4,760	245	19,205	1,329
1999	5	680	$1,114	135,904	129	5,268	$8,636	245	18,069	1,352
2000	8	842	$1,397	105,218	168	5,010	$8,317	416	25,076	1,344
2001	5	781	$1,306	156,228	172	4,542	$7,594	343	20,683	1,405
2002	6	501	$914	83,462	150	3,338	$6,093	247	13,687	1,229
2003	5	363	$650	72,697	103	3,529	$6,311	191	7,790	1,188
2004	4	280	$502	69,992	62	4,516	$8,089	107	5,391	1,355
2005	4	446	$797	111,530	129	3,458	$6,178	156	12,440	1,241
2006	5	612	$1,092	122,455	164	3,733	$6,660	247	16,947	1,428
2007	4	540	$865	135,028	169	3,196	$5,120	369	18,411	1,544
2008	5	548	$856	109,691	151	3,632	$5,666	298	17,436	1,591
2009	6	775	$1,419	129,098	206	3,760	$6,890	501	29,031	1,675
2010	5	648	$1,131	129,619	160	4,051	$7,069	327	31,706	1,746
Vessel and trip averages based on data across rows.										
97-00	8	769	$1,156	93,152	175	4,404	$6,626	313	22,513	1,351
01-05	5	474	$834	98,812	123	3,850	$6,767	209	11,998	1,284
06-10	5	625	$1,073	124,941	170	3,675	$6,310	348	22,706	1,597

Source: NMFS, SEFSC, Golden Crab Logbook (LBK), and ALS; US, BLS, PPI. The pound and dollar totals for 2005 are estimated.

Vessel captains tend to have long tenure and experience in commercial fishing, and they are likely to make a trip only if they expect trip gross revenue to cover trip costs, such as for fuel, ice, bait, food, and crew shares (payment methods vary for owner captains, hired captains, and crew; Shivlani et al., 2005, Tables 20 & 46). Demographic information on fishermen obtained in public hearings is summarized in the FMP, 1995, Section 3.7, Tables 4-5). Based on available, data, crews fishing for golden crab consist of four people, including the captain (FTT data for 2006-2010 for fewer trips than those with landings, 50th percentiles; half of the trips had smaller crews, and half had larger crews). Trip gross revenue was quite variable during 1995-2010, ranging from approximately $100 or less to $10,000 or more. The average for trip gross has been level to declining, and productivity (CPUE) in pounds per trap has declined (Tables 3.4.1-3.4.2; Figure 3.4.2).

[8]Although logbook reports became mandatory on October 28, 1996, there are some reports for late 2005 onward, and the data has been summarized by zone for analyst use (David Gloeckner, and Michael Judge, NMFS, SEFSC, personal communication, respectively, 14Sep10 and 16Aug10).

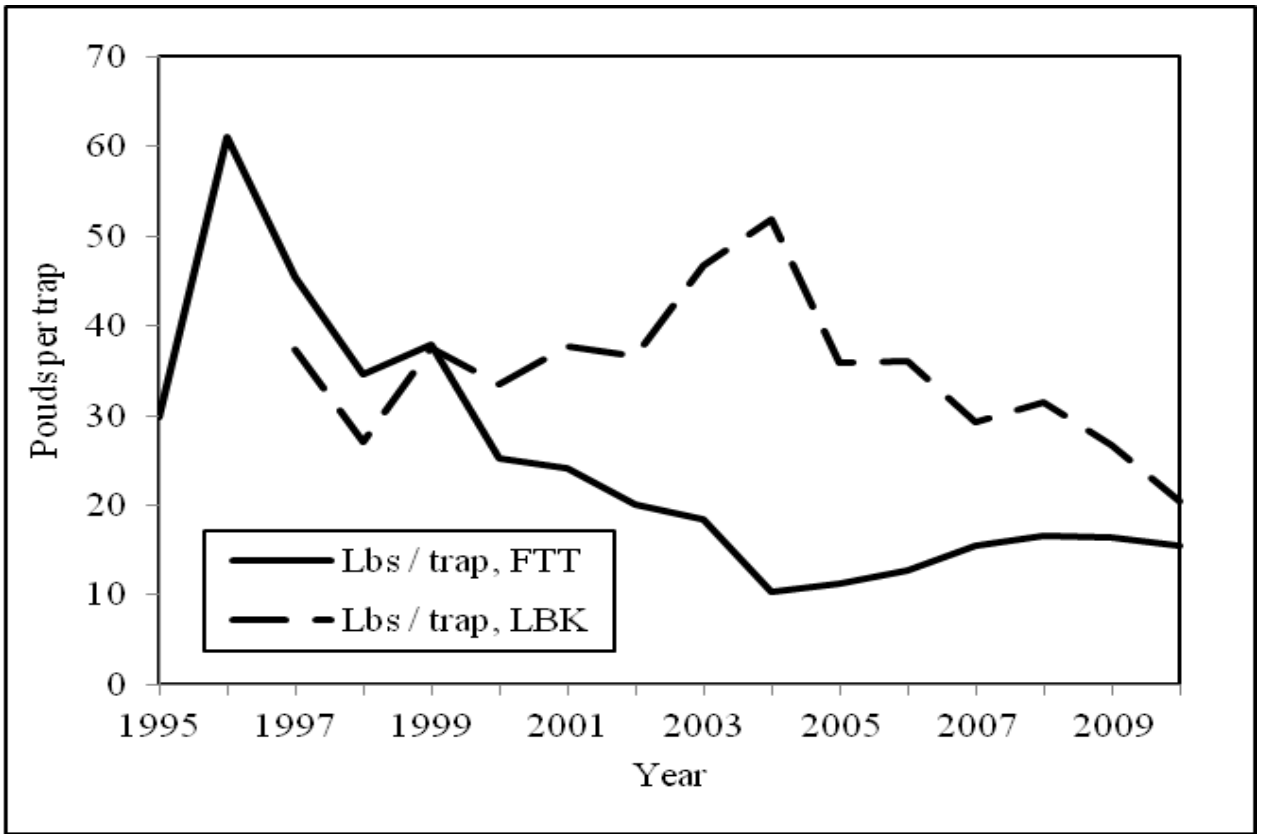


Figure 3.4.2 Golden crab, productivity (CPUE, FTT and LBK).

Some indices of fishing activity, effort and productivity (CPUE) for golden crab in 1995-2010 seem to be at variance (Tables 3.4.1-3.4.3 and Figures 3.4.2-3.4.3).[9] Increases in fishing effort since 2003-2004 appear to have boosted fishery landings (upper portion, Figure 3.4.3).

[9]This may trace to several factors, such as: underlying differences among sources in the observed values used for indices, the use of trap hauling date (LBK) and trip landing date (FTT) to assign date, year-to-year changes in fishing activity for high liner vessels, the small number of vessels with landings, and the limits of descriptive analysis.

T**able 3.4.3. Golden crab commercial fishing effort and productivity (FTT).**

Year	Thsnd lbs (ww)	Trips	Lbs / trip	Traps	Lbs / trap	Hours fished	Lbs / hour fished	Depth fished (feet)
1995	1,738	481	3,612	58,405	30	19,452	89	769
1996	830	150	5,535	13,604	61	7,311	114	985
1997	1,032	225	4,587	22,716	45	8,666	119	991
1998	425	139	3,056	12,303	35	4,323	98	997
1999	834	183	4,556	22,018	38	4,933	169	1,012
2000	934	301	3,102	37,038	25	8,449	111	1,078
2001	764	331	2,307	31,538	24	8,053	95	1,279
2002	516	278	1,856	25,774	20	8,377	62	1,202
2003	332	180	1,846	18,051	18	6,247	53	1,226
2004	312	176	1,772	29,941	10	7,386	42	1,270
2005	392	313	1,252	34,720	11	10,562	37	1,229
2006	416	331	1,257	32,698	13	13,640	30	1,360
2007	440	321	1,371	28,337	16	13,190	33	1,567
2008	494	244	2,024	29,834	17	10,806	46	1,589
2009	549	291	1,887	33,522	16	16,803	33	1,677
2010	557	338	1,648	36,021	15	20,247	28	1,723
Five-year averages based on data in rows.								
96-00	811	200	4,063	21,536	38	6,736	120	1,013
01-05	463	256	1,812	28,005	17	8,125	57	1,241
06-10	491	305	1,610	32,082	15	14,937	33	1,583

Source: NMFS, SEFSC, Florida Trip Ticket (FTT), and US BLS, PPI. The pound and dollar totals for 2005 are estimated.

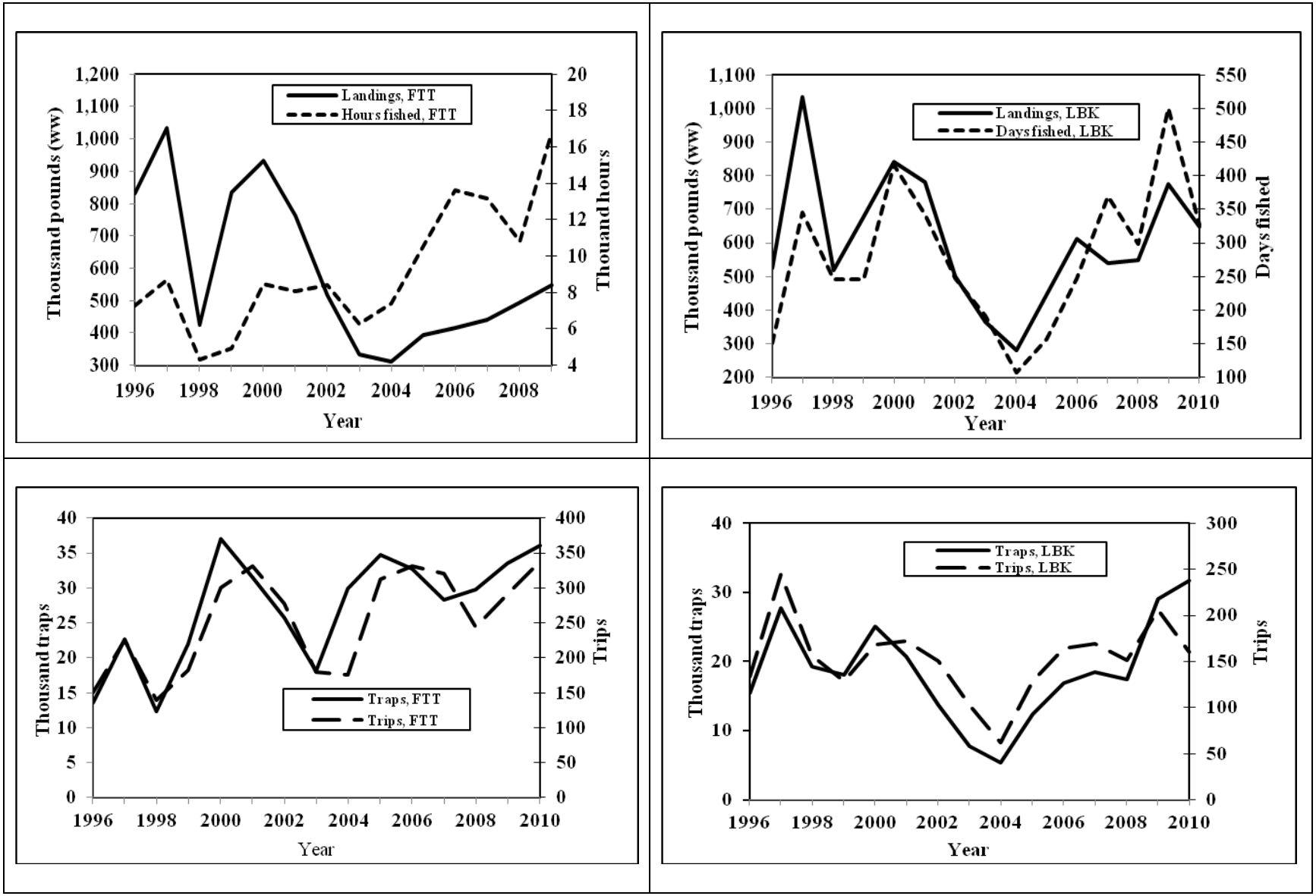


Figure 3.4.3. Golden crab, landings and fishing effort (FTT and LBK, vertical axes may not begin zero).

In the last two 5-year periods, monthly landings of golden crab have tended to be higher in February-May, approximately 40,000 to 50,000 pound per month, and seasonally low in November, 21,000 pounds (Figure 3.4.4). Effort is seasonal as well, ranging from as much as 1500 hours fished per month in January-September to a low of 800 hours in November, while the number of trips ranges from approximately 30 per month in January-May to a low of 15 in November (Figure 3.4.5, averages by month based on data for 2006-2010).

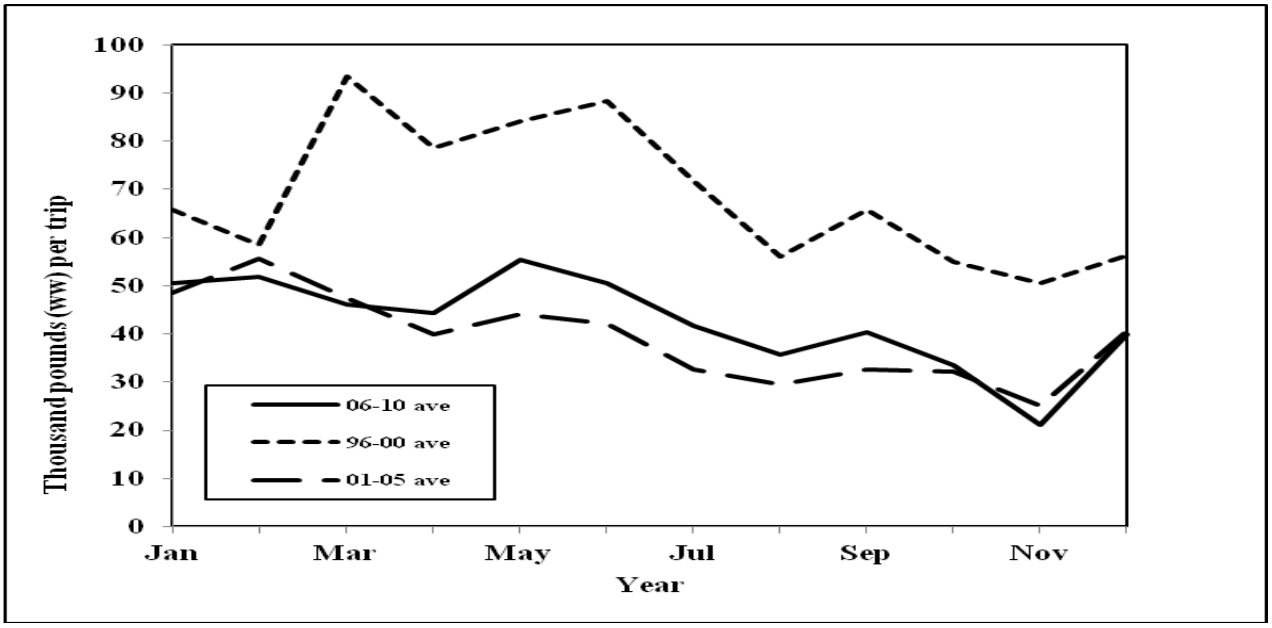


Figure 3.4.4. Monthly landings, golden crab (FTT).

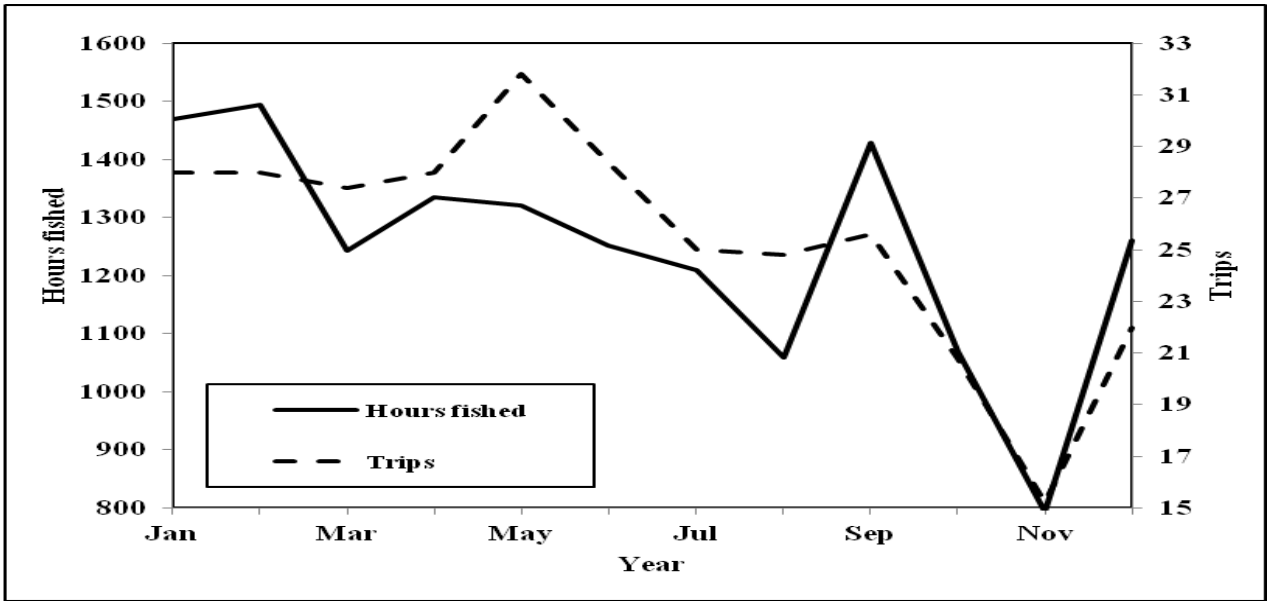


Figure 3.4.5. Monthly effort, golden crab (LBK, vertical axes do not begin at zero).

3.4.3 Social and Cultural Environment

The fishing communities of North Carolina, South Carolina, and Georgia are included in the Fishery Ecosystem Plan (SAFMC, 2009); however, the actions proposed in this Amendment to the Golden Crab FMP are limited to the golden crab fishery that currently operates off the east coast of Florida. Thus, presented below is information to provide the reader a general view of the potential fishing communities existing off the east coast of Florida.

Florida Fishing Infrastructure and Community Characterization
The following tables provide a general view of the presence or absence of fishing infrastructure located within the coastal communities of Florida with substantial fishing activity. There are many other attributes that might have been included in this table; however, because of inconsistency in rapid appraisal for all communities, these items were selected as the most consistently reported or had secondary data available to determine presence or absence. In some cases certain infrastructure may exist within a community but was not readily apparent or could not be ascertained through secondary data. **Table 3-4** offers an overview of the presence of the selected infrastructure items and provides an overall total score that is merely the total of infrastructure present.

Table 3-1. Fishing infrastructure table for Florida potential fishing communities

Community	Federal Commercial Permits (5+)	State Commercial Licenses (10+)	Federal Charter Permits (5+)	Seafood Landings	Seafood retail markets	Fish processors, Wholesale fish house	Recreational docks / marinas	Recreational Fishing Tournaments	Total
Atlantic Beach	-	+	-	+	+	+	+	-	5
Big Pine Key	+	+	+	+	+	+	+	-	7
Boca Raton	+	+	-	-	+	-	+	-	4
Cape Canaveral	+	+	-	+	+	+	+	+	7
Fernandina Beach	+	+	+	+	+	+	+	+	8
Fort Pierce	+	+	+	+	+	+	+	+	8
Islamorada	+	+	+	+	+	+	+	+	8
Jupiter	+	+	+	+	+	+	+	+	8
Key Largo	+	+	+	+	+	+	+	+	8
Key West	+	+	+	+	+	+	+	+	8
Marathon	+	+	+	+	+	+	+	+	8
Merritt Island	+	+	-	+	+	+	+	-	6
Palm Beach	+	+	-	+	+	-	+	+	6
Ponce Inlet	+	+	+	+	+	+	+	+	8
Sebastian	+	+	+	+	+	+	+	+	8
St. Augustine	+	+	+	+	+	+	+	+	8

In attempting a preliminary characterization of potential fishing communities in **Table 3-5**, we have provided a grouping of communities that appear to have more involvement in various fishing enterprises and therefore are classified as primarily involved. These communities have considerable fishing infrastructure, but also have a history and culture

surrounding both commercial and recreational fishing that contributes to an appearance and perception of being a fishing community in the mind of residents and others. The communities are not ranked in any particular order, this is merely a categorization.

Table 3-2. Preliminary Characterization of Potential Fishing Communities in Florida

Primarily Involved	Secondarily Involved
Fernandina Beach	Atlantic Beach
Fort Pierce	Boca Raton
Islamorada	Palm Beach
Jupiter	
Key Largo	
Key West	
Marathon	

Many of these communities are in transition due to various social and demographic changes from coastal development, growing populations, increasing tourism, changing regulations, etc. This preliminary characterization is just that and should not be considered a definite designation as fishing community, but a general guide for locating communities that may warrant consideration as a potential fishing community.

4 Environmental Consequences

4.1 Action 1. Establish eligibility criteria for a golden crab catch share program

Alternative 1. No Action. Do not establish eligibility criteria for a golden crab catch share program

Alternative 2. Restrict eligibility to valid commercial golden crab permit holders who have made landings of 1 pound or greater between 2001 and 2010.

Alternative 3. Restrict eligibility to valid commercial golden crab permit holders who have made landings of 1 pound or greater between 2005 and 2010.

Preferred Alternative 4. Restrict eligibility to valid commercial golden crab permit holders. Eligibility for participation in this catch share program is defined as having a valid commercial golden crab permit as of the control date of 12/7/2010.

4.1.1 Biological Effects

This action would not directly affect the biological environments. However, alternatives for this action could have indirect effects by influencing the total number of shareholders and how the fishery is prosecuted.

Alternative 1 would not restrict participation in the catch share program (Table 4-1). **Alternatives 2-4** would restrict initial participation in the program to individuals who already have some experience in the golden crab fishery. Generally, the amount of effort applied to the fishery would decrease as participation is limited to fewer, more efficient individuals. This would result in less gear and time used in pursuing golden crab and, consequently, less adverse impacts in the form of habitat interactions, regulatory discards, and bycatch of non-target species.

Table 4-1. Number of permits eligible under each alternative for Action 1 for 2001-2010.

Alternative	Number of Permits Eligible to Receive Initial Allocation
1	NA
2	8
3	7
4 (Preferred)	11

4.1.2 Economic Effects

While the number of currently valid permits is understood to be 11, each vessel must have a valid permit on board to harvest or possess golden crab, and an average of only 5 vessels per year landed golden crab during 2006-2010, compared with as many as 11-15 vessels in 1995-2010 (Section 3.4.2). Some of the five "small business entities" (SBA) engaged in harvesting golden crab own or control through affiliation more than one permitted vessel.[10] It is assumed that **Alternative 1 (No Action)** brings with it the Fishery Management Plan for the Golden Crab Fishery of the South Atlantic Region's (Golden Crab FMP) long-standing vessel-permit based limited access system, which is for the South Atlantic exclusive economic zone (EEZ). An Annual Catch Limit (ACL) of 2 mp was added via Amendment 5 to the Golden Crab FMP (2011) through the Comprhensive ACL Amendment. This is well in excess of average landings in the last 5 years (0.491 mp), and the average of 0.811 mp for 1996-2000, though landings in 1995 were 1.7 mp. Because there are approximately 11 permits, and a valid permit is required to be onboard each vessel that possesses or lands golden crab from the South Atlantic EEZ, **Alternative 1** would not open the fishery to unlimited numbers of participants. However, **Alternative 1** would not meet the South Atlantic Fishery Manangement Council's (Council) intent to establish a catch share program.

As a caveat to the analysis of economic effects of proposed regulations, **Alternatives 2-4** (for harvesting sector permit holders, not vessels) in this section and alternatives for other actions in Amendment 6 to the Golden Crab FMP (Amendment 6), it should be clearly noted that the economic description of the golden crab fishery in Section 3.4.2 is based on golden crab logbook data, and Florida trip ticket (FTT) data, both of which have vessel, trip, dealer and other identifiers in the individual data records, but not vessel-permit-holder identifiers. Therefore, for the analysis of biological, economic, social and administrative effects in Section 4, vessel-permit-holder identifiers have been added to golden crab logbook data records in so far as possible, resulting in a combined logbook-permit ("permit_landings") data base. The results are not perfect. There are some precautions; e.g., permit holders may change vessels, sell their fishing business and/or fishing permits, lease permits, use name variants, change their names (including corporate and business names), and decide to have the one or more vessels enter or exit the fishery. Bioeconomic models for fisheries with larger numbers of vessels, such as the Gulf of Mexico shrimp fishery, have been specified and estimated to study vessel entry and exit behavior. As indicated previously in this section, the SBA uses the term "small business entities," which appears to apply to the golden crab fishery's harvesting sector, because such entities own or control through affiliation more than one permitted vessel (see first footnote, Section 4.1.2).

If **Preferred Alternative 4** were to be accepted for use in subsequent actions to establish a catch share system under Amendment 6, then 11 currently valid permits could be eligible. Only 8 of the 11 currently valid permits would meet the **Alternative 2** qualification criteria, and 7 would meet the **Alternative 3** criteria**. Alternative 2** or **Alternative 3** would reduce the number of permitted vessels that could fish below 11, but would not reduce the number

[10]The U.S. Small Business Administration (SBA) states: "Individuals or firms that have identical (or substantially identical) business or economic interests may be treated as though they are affiliated. Family members, persons with common investments, or firms that are economically dependent through contractual (or other) relationships, are among those treated this way" (13 C.F.R. § 121.103(f)).

of small business entities engaged in harvesting golden crab below 5. Allowing for the caveat indicated previously in this section, and assuming one permit per vessel, **Alternative 2** or **Alternative 3** would not be expected to reduce the number of vessels fishing from 5 on average in 2006-10 (Table 3.2.2). Of course, some vessels that may have fished in the past would not be able fish unless under the control of a valid-permit holder.

Among the four alternatives, **Alternative 2** and **Alternative 3** would address the stated purpose and need for Amendment 6 more directly than **Alternative 1** or **Preferred Alternative 4**. That is, having fewer permitted participants may: (1) help assure that fishing continues to occur under captains with the level of experience that is needed to harvest golden crab near several deepwater coral ecosystems; (2) enhance on-board refrigerated seawater storage systems as part of a quality assurance program; and (3) facilitate end-product market development (Section 1.1). Section 3.4.1 describes the very difficult conditions associated with harvesting golden crab.

Whether the golden crab fishery would become more economically viable and profitable with fewer vessels over the long term is not clear. What appears to have been increased fishing effort during 1995-2010 may be assumed to have affected costs, even though the number of vessels with landings decreased (Section 3.4.2). As indicate in Section 3.4.2, the fishery has a small number of participants, and fishing activity of high-liner vessels (including fishery entry and exit) may contribute fluctuations in fishing-effort and other indicator variables. The lowest number of permits under Action 1, 7 permits for **Alternative 3**, exceeds the number of vessels with landings in the last 5 years, though it is less than the number of vessels with landings in some preceding years. Contemporary cost and returns data to help assess economic profitability may become available at some time in the future, based on a planned economics add-on to golden crab logbooks.[11] For vessels that landed golden crab, the overall total vessel gross revenue was $913,000 (2010$) per year during 2006-2010, regardless of species, area of capture, or gear (Table 3.4.1, FTT data). This averages $198,000 per vessel. The total is less than the $2,244,000 for 1996-2000 ($239,000 per vessel) when other species accounted for half of the total. For the golden crab fishery as a whole, costs appear to have increased, because trip fishing effort appears to have increased to equal or exceed what it was in the late 1990s. Catch per unit effort (CPUE) in pounds per trap is lower, and the depth of fishing is greater, approximately 1,600 feet below the water surface in the last five years (Tables 3.4.1-3.4.3 and Figure 3.4.2). The numbers of trips, traps fished, and time fished (time away from port) would be expected to increase the costs for fuel, an important part of trip costs, and fuel prices have been much higher than in the late 1990s (U.S. Bureau of Labor Statistics, producer price index, no. 2 diesel). Of course, more fuel efficient engines would offer some offset, and the same would seem to be true for refrigerated sea water storage (compared with having to carry large amounts for ice; Section 1.1).

[11]Scott Crosson, NMFS, SEFSC, pers. comm. Some earlier data is shown in the FMP, 1995, Section 3.7, Tables 4-5. Although the surveyed multi-species vessels engaged in very little fishing for golden crab, other data is shown in Shivlani et al., 2005, Tables 20 & 46).

4.1.3 Social Effects

Establishing a catch share program may affect participation in the golden crab fishery. Negative social effects could be experienced by some golden crab permit holders who did not meet the eligibility requirements under **Alternatives 2-4 (Preferred)**. **Alternative 1** would not allow any golden crab fishermen to receive an allocation and would not be compatible with the implementation of a catch share program. **Alternatives 2** and **3** would exclude some golden crab permit holders as ineligible (see **Table 4-1),** which may have negative impacts if the permit holders planned to start harvesting golden crab again due to the new requirement to hold catch shares or annual pounds. **Preferred Alternative 4** would designate all permit holders as eligible to receive catch shares and likely have the least impact on the social environment. In general, the social impacts will be more directly caused by allocation of catch shares among eligible individuals (**Action 2**).

4.1.4 Administrative Effects

Alternative 1 (No Action) no action would have the least impact on the administrative environment as it would not lead to the establishment of a catch share program. The initial administrative effects of **Alternatives 2-4** would be very similar since there are very few participants in the golden crab fishery. Allowing more individuals to be eligibile for initial allocation in the catch share program increases the amount of administrative burden involved in implementing the program. Depending on which alternative is chosen, the number of potential participants in the catch share program varies. **Alternative 4 (Preferred)** would potentially include the most participants and require the greatest amount of work to implement. **Alternative 3** would include at most 7 participants and potentially have the lowest administrative burden, followed by 8 eligible permits in **Alternative 3**.

4.1.5 Conclusion

4.2 Action 2. Initial apportionment of catch shares

Alternative 1. No action. Do not specify a method for initial apportionment of catch shares.

Alternative 2. Distribute initial catch shares proportionately among eligible participants based on the aggregate annual golden crab landings from logbooks associated with their current permit(s) during the time period 2002 through 2010.

Alternative 3. Distribute initial catch shares proportionately among eligible participants based on the aggregate annual golden crab landings from logbooks associated with their current permit(s) during the time period 1997 through 2010.

Alternative 4. Distribute 50% of initial catch shares equally among eligible

participants and distribute 50% of initial catch shares among eligible participants based on the aggregate annual golden crab landings from logbooks associated with their current permit(s) during the time period 1997 through 2010.

Sub-alternative 4a. To receive catch shares distributed equally among eligible participants, aggregate golden crab logbook landings between 1997 and 2010 associated with an eligible participant's current permit must equal or exceed 25,000 pounds.

Sub-alternative 4b. To receive catch shares distributed equally among eligible participants, aggregate golden crab logbook landings between 1997 and 2010 associated with an eligible participant's current permit must equal or exceed 50,000 pounds.

Alternative 5. Distribute 25% of initial catch shares equally among eligible participants and distribute 75% of initial catch shares among eligible participants based on the aggregate annual golden crab landings from logbooks associated with their current permit(s) during the time period 1997 through 2010 .

Sub-alternative 5a. To receive catch shares distributed equally among eligible participants, aggregate golden crab logbook landings between 1997 and 2010 associated with an eligible participant's current permit must equal or exceed 25,000 pounds.

Preffered Sub-alternative 5b. To receive catch shares distributed equally among eligible participants, aggregate golden crab logbook landings between 1997 and 2010 associated with an eligible participant's current permit must equal or exceed 50,000 pounds.

Alternative 6. Distribute initial catch shares proportionately among eligible participants based on the best consecutive three year average of golden crab logbook landings associated with their current permit(s) during the time period 1997 through 2010.

4.2.1 Biological Effects

This action would not directly affect the biological environments. However, alternatives for this action could have indirect effects by influencing the total number of shareholders and how the fishery is prosecuted.

Alternative 1 would not establish catch history allocation and would essentially not establish a catch share program. Most of the impacts associated with this alternative would be the same as those described for **Action 1**, Alternative 1 to not create a catch share program.

Alternatives 2-6 would base initial allocation on certain landing years and catch levels. It would be expected that vessels with the most recent landing history and those that meet the highest requirements for pounds landed would have the most experience in the fishery. This

may result in less gear and time used in pursuing golden crab and, consequently, less adverse impacts in the form of habitat interactions, regulatory discards, and bycatch of non-target species as described in **Action 1**.

4.2.2 Economic Effects

Under **Action 1**, **Alternatives 2**, **3**, and **4 (Preferred)**, the number of permits eligible to participate in the golden crab catch share program are 8, 7, and ~~10 o~~r 11, respectively. Three permits would not qualify under **Action 1**, **Alternative 2**, and the remaining 8 permits would have initial allocations ranging from near 0% through 57% under the **Alternatives 2-6** for **Action 2**.

Four permits would not qualify under **Action 1**, **Alternative 3**, and the remaining 7 permits would have initial allocations ranging from near 0% through 58% under **Alternatives 2-6** for **Action 2**.

All 11 permits would quality under **Action 1**, **Preferred Alternative 4**, and they would have initial allocations ranging from near 0% through 57% under **Alternatives 2-6** for **Action 2**. Taking the two preferred alternatives together, the initial allocations for permit holders would be in the range of near-zero percent through 36% (**Action 1**, **Preferred Alternative 4**, and **Action 2**, **Preferred Alternative 5b.**

4.2.3 Social Effects

The social effects of the initial allocation of catch shares are mostly associated with vesting these fishing privileges to a permit, which will result in social benefits and social costs. Beneficial effects would be experienced by individuals with permits who receive an allocation by allowing fishermen to harvest golden crab during times when it is most efficient, profitable, and safe. For fishermen who do not receive an allocation (or receive an allocation that is smaller than needed to make a profit), the allocation of catch shares can have broad negative social impacts at the individual and community level. These fishermen would lose current and future access to the fishery.

For fishermen who receive catch shares under **Alternatives 2-6**, the golden crab ACL specified in the Comprehensive ACL Amendment would result in allocation of shares to individuals that are higher than the individuals' current landings, and the expected social costs from limited harvest would not occur for this catch share program. Therefore, the most significant social impact would result from implementation of the catch share program and less from the allocation method.

The overall outcomes from allocating shares and from the different allocation formulae are described in detail in **Sections 4.2.1** and **4.2.2**. **Alternative 1** would likely result in no effects on the social environment because no catch shares would be allocated to golden crab

fishermen. Allocation formulas that are based completely on catch history, as in **Alternatives 2** and **3**, would benefit larger operations by allocating more shares to fishermen who have harvested more golden crab. For newer entrants or smaller operations, **Alternatives 2** and **3** may result in smaller allocations that limit opportunity for future expansion, although the shorter qualifying period in **Alternative 3** would be more beneficial to the smaller operations. **Alternatives 4** and **5** consider combination formulas using landings history and an equal allocation, which would allow smaller operations and newer entrants to receive more shares than under **Alternatives 2** and **3. Alternative 5** requires a greater historic catch level for eligibility than **Alternative 4**, and receiving more shares would be more beneficial for larger operations. **Alternative 6** would result in a similar distribution of shares as **Alternatives 4** and **5**, and would be expected to have similar social effects. **Sub-alternatives 4a, 5a** and **6a** require lower minimum landings requirement to qualify than **Sub-alternatives 4b, 5b (Preferred)** and **6b,** and would allow fishermen with lower landings history to receive allocation.

4.2.4 Administrative Effects

Alternative 1, no action would have the least impact on the administrative environment as it would not establish initial allocation based on catch history and would not lead to the establishment of a catch share program. The initial allocation schemes as described under **Alternatives 2-6** and associated sub-alternatives would have similar administrative impacts associated with reviewing the catch history and determining who would qualify under the different alternatives.

4.2.5 Conclusion

4.3 Action 3. Establish criteria and structure of an appeals process

Alternative 1. No Action. Do not specify provisions for an appeals process.

Alternative 2. A percentage of the golden crab shares for the initial fishing year under the program will be set-aside to resolve appeals for a period of 90-days starting on the effective date of the final rule. The Regional Administrator (RA) will review, evaluate, and render final decisions on appeals. Hardship arguments will not be considered. The RA will determine the outcome of appeals based on NMFS' logbooks. If NMFS' logbooks are not available, the RA may use state landings records. Appellants must submit NMFS' logbooks or state landings records to support their appeal. After the appeals process has been terminated, any amount remaining from the set-aside will be distributed back to remaining shareholders according to the redistribution method selected under Action 2.

Preferred Sub-alternative 2a: Three percent of golden crab shares will be set aside for appeals.

Sub-alternative 2b: Five percent of golden crab shares will be set aside for appeals.

Sub-alternative 2c: Ten percent of golden crab shares will be set aside for appeals.

Sub-alternative 2d: Two percent of golden crab shares will be set aside for appeals.

4.3.1 Biological Impacts

Establishing an appeals process for a catch share program is an administrative action. Therefore, it is not anticipated to directly or indirectly affect the physical, biological or ecological environments in a positive or negative way. **Alternative 1 (No Action)** would indirectly benefit the biological environment because it would not allow any additional golden crab effort after the catch shares are distributed to eligible permit holders. Indirect effects on the biological environment may be caused if additional permit holders are issued catch shares as a result of implementing an appeals process.

4.3.2 Economic Impacts

The adoption of **Alternative 1**, the no action alternative, would not include the establishment of an appeals process in the catch share program. **Alternative 2** with sub-alternatives considers the establishment of an appeals process. **Alternative 2 and associated sub-alternatives** serve to help ensure the golden crab ACL would not be exceeded the first year of the program in the event many appeals are settled in favor of fishermen. Setting aside a portion of the ACL for appeals purposes limits the likelihood of major share adjustments that would need to take place after initial allocation in an effort for fishermen to adjust their shares to current catches. Smaller reductions would be more acceptable to currently active fishermen than large reductions in share allocations during the first fishing season. Use of initial allocation methodologies that allocate shares to currently active fishermen would also help.

The establishment of an appeals process and the design of its structure have mainly equity effects. While equity considerations are important, they have less significance in the shaping the economic implications of a catch share system. Thus, neither the appeals process nor its structure is expected to have a noticeable effect on the benefits associated with the implementation of the catch share program. This is particularly true when an appeals process would only marginally affect the initial distribution of shares among eligible participants. Economic changes would only be evident if the number of successful appeals were large compared to the number of qualifying persons or vessels.

An appeals process provides the potential participants an avenue to set the record straight with respect to transfers of licenses and the associated landings history for each license. Since most of the landings histories are currently on record through logbook submissions, the aggregate amount of contentious landings involved in the appeals is expected to be relatively low. The administrative and public cost of an appeals process for the proposed catch share cannot be estimated but may be expected to rise with the number of appeals.

4.3.3 Social Impacts

Establishment of an appeals process is an important component of a catch shares program because it provides an avenue for fishermen to request a review of the allocations. The absence of an appeals process, as would occur under **Alternative 1 (No Action)** would likely result in fewer social benefits than **Alternative 2** if any golden crab fishermen did not receive an allocation or had an allocation that did not accurate reflect landings history. Establishment of an appeals process in **Alternative 2** would also contribute to a fair and equitable allocation for the catch share program. The set-asides to be used for appeals (**Sub-alternatives 2a-2d**) would result in social benefits by providing a specific amount of golden crab shares to be used to resolve any appeals. Although **Preferred Sub-alternative 2d** designates the lowest percentage (2 percent) for appeals, it will be as beneficial as **Sub-alternatives 2a-2c** due to the 2 million pound ACL for the golden crab fishery.

4.3.4 Administrative Impacts

Alternative 1 could cause administrative difficulties by failing to provide a formal process to use in resolving the complaints of those who challenge eligibility or initial allocation decisions. The appeals processes proposed in **Alternative 2** and associated sub-alternatives would be somewhat burdensome to administer. The set-aside proposed in **Alternative 2** and associated sub-alternatives would allow needed share adjustments resulting from the appeals process to occur more expeditiously.

4.4 Action 4. Establish criteria for transferability

Alternative 1. No Action. Do not establish criteria for transferability.

Alternative 2. Shares or annual pounds can only be transferred to golden crab permit holders.

Alternative 3. Shares or annual pounds can only be transferred to golden crab permit holders during the first five years of the catch share program and all U.S. citizens and permanent resident aliens thereafter.

4.4.1 Biological Impacts

Alternative 1 (No Action) would not allow for transferability of golden crab catch share annual pounds and could result in decreased participation in the golden crab fishery if golden crab fishermen are unable to fish their annual pounds. Over time, decreased participation could result in a corresponding decrease in effort and landings of golden crab. Therefore, among **Alternatives 1-3**, no action **Alternative 1** could have the greatest biological benefit for the golden crab stock if it results in decreased landings of golden crab. However, based on recent data there does not appear to be a biological need to decrease landings of golden crab. Since this action is administrative and does not establish immediate harvest objectives, it will not directly affect the protected species.

Alternatives 2 and **3**, which would allow transferability of golden crab annual pounds, would not be expected to negatively impact the golden crab stock. The biological effects of **Alternatives 2** and **3** would likely be very similar as landings would be constrained by the ACL for the golden crab stock. Therefore, the effects of **Alternatives 2** and **3** may have more economic and administrative impacts than biological impacts.

4.4.2 Economic Impacts

In general, allowing for transferability of shares increases the efficiency of harvest operations and maximizes the harvest of golden crab, subject to ACL restrictions. Without an allowance for transferability of shares, two things can occur. First, if sale of annual pounds is allowed, shareholders would likely need to lease/sell annual pounds when their vessel needs maintenance or other issues arise that prevent them from being able to fish for a significant period of time. This can lead to large levels of leasing and an environment that is often referred to as "sharecropping" or allowing for "armchair" fishermen to benefit from share ownership. Second, if sale of annual pounds is not allowed and shareholders are not able to fish due to sickness, vessel mechanical problems, or other issues, the ACL would not be reached and maximum profits (subject to variability in weather conditions) would not be realized.

Alternative 1 is not consistent with implementation of a catch share program. **Alternative 2** requires the sale of shares only to another fisherman already permitted in the fishery. Such a requirement could stifle new entrants into the fishery as well as make it more difficult for a fisherman to sell shares because the potential pool of buyers would be greatly reduced to only those few already in the fishery, thus making it more difficult for a fisherman wanting to sell shares. **Alternative 3** has the same requirements as **Alternative 2**, but only for five years. After that initial period, this alternative requires U.S. citizenship for permit ownership. It allows sale between permit holders which decreases the risk of speculation because it adds an additional cost to the ability to transfer shares. That is, it increases the likelihood that only fishermen would transfer shares. The ability to transfer shares allows for increase efficiency for harvesters to land amounts of golden crab equivalent to their operational capacity, increasing profitability for the fleet as a whole.

Alternative 3 is the least restrictive of **Alternatives 2** and **3**. It allows any U.S. citizen to transfer shares after five years. This may result in speculation and drive up the price for golden crab shares. It also results in flexibility. Given the small number of permit holders, this increases the opportunities for fishermen to purchase shares if other fishermen are unwilling to sell shares to them. This could increase aggregate profits for the fishery. However, this could also decrease aggregate profits if it increases the cost of fishing through increase share price due to speculation.

4.4.3 Social Impacts

Generally, it can be argued that social benefits that are tied to economic outcomes would be maximized the fewer the constraints placed on the transfer of an asset. Unencumbered transfer allows the largest pool of recipients, which would be expected to result in the

payment of the highest price for the asset. Additionally, allowing transferability would provide an avenue for new entrants to enter the fishery and for current participants to expand operations. Although it would take time for such to occur, an inability to transfer golden crab shares as would be the case under **Alternative 1 (No Action)**, would mean that, absent subsequent action, the number of entities harvesting golden crab would decrease over time as fishermen retire or cease harvesting golden crab for other reasons, eventually ending in no participants or legal commercial harvest. This would be inconsistent with the expectation that active participation, at some unspecified level, and harvest would be expected to result in greater social and economic benefits. As a result, **Alternative 1 (No Action)** would be expected to result in reduced social benefits relative to the other alternatives. In all likelihood, however, the adoption of **Alternative 1 (No Action)** would result in subsequent future management action to allow new participation in the golden crab fishery.

Because **Alternative 2** would limit the number of potential buyers, it would likely result in fewer social benefits than **Alternative 3**, although potential buyers who intend to harvest golden crab with the catch shares need to hold one of the 11 available golden crab permits, which limits the number of buyers regardless. However, allowing any eligible entity to purchase shares (**Alternative 3**) may result in some buyers purchasing shares without intent to harvest, and this would result in negative social impacts on active harvesters.

Any ability to transfer catch shares may result in equity criticisms, because it would bestow harvest privileges to the recipient and the recipient would possess a new marketable asset. The value of the catch share would represent a windfall profit for the catch share recipient, in addition to any benefits from actual harvests, a circumstance that may seem inequitable to entities denied an allocation upon their initial issuance. While transferability would allow those denied an allocation or new entrants the opportunity to acquire golden crab catch shares and harvest this species, they could do so only if they purchased catch shares, the value of which is unknown at this time.

4.4.4 Administrative Impacts

Establishing a catch share program will have some level of administrative burden on the agency related to developing and administering the program as well as providing information to the fishing community on the program. Adding transferability (**Action 4**) to the structure of the catch share program would increase the administrative burden, requiring the tracking of shares or annual pounds, once transferred. The least administratively burdensome alternative would be **Alternative 1 (No Action)** which would not allow transferability. **Alternatives 2-3** would allow some form of transferability between users. These alternatives are expected to have similar administrative impacts and most of this would be related to the development of an online platform to support the catch share program. An administrative burden will also be felt by fishermen through all of the alternatives, through the process of transferring the endorsements.

4.5 Action 5. Define quota share ownership caps

Alternative 1. No Action. Do not constrain the percentage of catch shares held by a person, including a corporation or other entity

Alternative 2. No person, including a corporation or other entity, may individually or collectively hold catch shares in excess of the maximum share initially issued to any person at the beginning of the IFQ program,

Alternative 3. No person, including a corporation or other entity, may individually or collectively hold catch shares in excess of 25 percent of the total shares.

Alternative 4. No person, including a corporation or other entity, may individually or collectively hold catch shares in excess of 35 percent of the total shares.

Preferred Alternative 5. No person, including a corporation or other entity, may individually or collectively hold catch shares in excess of 49 percent of the total shares.

Note: For the purposes of considering the share cap, an individual's total catch share is determined by adding the applicable catch shares held by the individual and the applicable catch shares equivalent to the corporate share the individual holds in a corporation. A corporation's total catch share is determined by adding the applicable catch shares held by the corporation and any other shares held by a corporation(s) owned by the original corporation prorated based on the level of ownership.

4.5.1 Biological Impacts

This action would not directly affect the biological environment. However, alternatives for this action could have indirect effects by influencing the total number of individuals holding catch shares.

A share cap could increase the amount of consolidation in the fishery. Ownership caps are designed to prevent monopolies from developing. The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), in Section 303A(c)(5)(D), indicates limited access privilege programs such as catch share programs must include provisions to prevent an individual or entity from holding an excess amount of shares. In other terms, a catch share program must set a cap on share ownership. The lower the cap is set, the more likely the current makeup of the participants by size of operation would be maintained and community structure would be supported. However, if the cap is too low, efficiency would be impaired. If the cap is set below the historical maximum share, those participants above the cap are typically grandfathered in at their historical share. Sale of grandfathered shares has restrictions. Caps apply to shares owned individually and through corporations.

Alternative 1 does not comply with the Magnuson-Stevens Act. National Standard 4 states that management measures should be "carried out in such a manner that no particular individual, corporation, or other entity acquires an excessive share" of fishing privileges. Without a share cap, accumulation of excessive shares could not be prevented, shares could

become concentrated among only a few participants, and those participants could gain excessive market power. As a result, availability of golden crab could decrease and prices for consumers could increase. National Standard 8 requires management measures take into account sustained participation of fishing communities. If shares accumulate with only a few participants, the structure of the fishery and its relationship to communities will be disrupted. Conversely, consolidation of shares would increase the efficiency of the fishery, consistent with National Standard 5. Fewer vessels in the fishery would result in lower overall operational costs.

Alternatives 2-5 (Preferred) would limit the amount of shares an individual or entity could own. This amount would include shares owned individually and through a corporation. A cap on share ownership would allow some consolidation while preventing accumulation of excessive shares.

4.5.2 Economic Impacts

Incorporating the proposed regulations of **Actions 1-2**, **Action 5** would result in share caps ranging from "0" (no share cap to a 49% share cap), as follows: **Alterative 2** (no share cap); **Alternative 3** (maximum share of 25% per person); **Alternative 4** (maximum, 35% per person); and **Preferred Alternative 5** (maximum, 49% per person). As indicated in Sections 3.4.2 there are caveats in the use of available data to assess the economic impacts of **Actions 1, 2** and **5**. **Actions 1, 2** and **5** have been assessed using historical landings, which averaged 0.491 mp during 2006-2010 (Table 3.4.1). It is understood that shares under **Action 5** would apply to the much larger ACL, 2.0 mp, with some adjustments, with the maximum share being 49%. Under SBA guidelines, which may differ from those applied in this amendment, it is noted that shares for small business entities may be larger than for individual owners, and to the extent that SBA guidelines applied, it appears that shares of landings for one small business entity may have exceeded 49% in some years and/or combinations of years. On the other hand, amounts for all golden crab fishery shareholders could increase, if they were to land their full share. As indicated at end of Section 4.1.2, it is not clear whether landings and productivity (CPUE) would increase under the proposed action. According to available data, CPUE declined during 1995-2010, even though the number of vessels fell sharply (Section 3.4.2). Ex-vessel prices did increase during the 15-year period, and one could attribute this to lower landings (Figure 3.4.1). It is possible that other factors were at work, such as cooperative efforts of vessel owners, processors and others, along with global conditions for seafood. Arguably, the proposed action could help achieve long-range planning, investment and marketing objectives of the Amendment (Section 1.2).

4.5.3 Social Impacts

Establishment of a limit on the proportion of shares that one individual may own has important social implications that are tied to the economic effects, such as market control, and also in equity issues for a fishery. Excessive share holding is a major concern in regards to catch share programs and may change distribution of effort and ownership if concentration occurs. In general, there must be a balance between preventing concentration and market control, and allowing fishermen to optimize harvest. **Alternative 1** would not establish a

share cap and would likely have negative social impacts due to the potential for one individual to control a majority of the shares, which would affect distribution among other harvesters. **Alternative 2** could result in a large share cap (depending on how shares are allocated), which would allow for expansion but could cause concentration of the fishery. As the potential share cap increases in **Alternatives 3-5 (Preferred)**, the possibility of concentration increases, but so does the potential for fishermen to expand.

It is noted that because the ACL for golden crab is higher than recent landings, it is likely that each permit holder would receive shares in excess of his recent landings history. Therefore, it is possible that the share caps in **Alternatives 3-5 (Preferred)** will not have negative social impacts that often result from limit on share ownership.

4.5.4 Administrative Impacts

Greater consolidation would result in fewer individuals and a lower administrative burden as described in **Action 1**. **Alternative 1 (No Action)** would allow the greatest amount of consolidation but would not be in compliance with the Magnuson-Stevens Act. Of the action alternatives, **Preferred Alternative 5** would allow for the greatest amount of consolidation and would have the least administrative burden.

Establishing a catch share cap would be administratively burdensome on the agency. An online catch share system would have to be developed in such a way to track share transfers and enforce the cap(s) and would require a system to prevent transfers that would exceed the cap(s).

4.6 Action 6. Use it or lose it policy

Alternative 1. No Action. Do not specify a minimum landings requirement for retaining shares.

Alternative 2. Shares that remain inactive for 3 CONSECUTIVE years will be revoked and redistributed proportionally among the remaining shareholders. "Inactive" is defined as less than 10% of the aggregate annual average utilization of the catch share quota over a 3 year moving average period".

Sub-alternative 2a. Landed crabs only.

Sub-alternative 2b. Landed crabs and/or transfer of annual pounds

Alternative 3. Shares that remain inactive for 3 CONSECUTIVE years will be revoked and redistributed proportionally among the remaining shareholders. "Inactive" is defined as less than 30% of the aggregate annual average utilization of the catch share quota over a 3 year moving average period".

Sub-alternative 3a. Landed crabs only.

Sub-alternative 3b. Landed crabs and/or transfer of annual pounds.

4.6.1 Biological Impacts

A catch share program would directly benefit the physical environment by reducing capacity and consolidating overcapacity. Less effort would result in less habitat-gear interactions, unless there is a shift in usage/effort to gear that may have greater negative impacts on the physical environment. **Alternative 1** would provide the greatest benefit to the biological environment, because participants would not be required to fish or lease their shares in order to retain them. If fishermen choose not to fish, then habitat-gear interactions would be reduced. **Alternative 3** would result in the least benefits to the biological environment of any of the action alternatives, because it would require participants to harvest on average 50

percent or more of their allotted shares over a three year period in order to retain them. The effects of **Alternative 2** would be intermediate to those of **Alternative 1** and **3**. The less fishermen are required to fish in order to retain shares, the greater the benefit to the marine environment.

4.6.2 Economic Impacts

Concerns associated with persons buying catch shares for the sole purpose of not using them are often cited as a reason to consider a "use it or lose it" provision. Economically under a "use it or lose it" provision, it would not make sense for fishermen to hold shares and not use them. At a minimum they would forgo the revenue associated with selling their shares. If they were efficient harvesters, the value of the shares they would forgo would be even greater. Because traditional harvesters of golden crab would be inclined to harvest their shares, the discussions associated with this provision usually focus on non-consumptive users buying shares.

Allowing persons to hold shares and not fish them would reduce net benefits to the Nation in the short run, but may benefit the golden crab stocks by reducing total removals. Short-term net benefits to the Nation would be reduced because the total amount of golden crab being produced would decrease, but the decrease in supply is not expected to have a significant impact on price.

The price flexibility associated with the amount of golden crab without a use it or lose it provision cannot be estimated with certainty. Price flexibility is estimated for a specific point on a demand curve. Determining the price flexibility associated with the use it or lose it provision would require estimating a demand curve for golden crab and making assumptions about the amount of quota that would not be fished. Both of those tasks are beyond the scope of this analysis.

Allowing people to buy shares and hold them would likely increase share prices. Fishermen would need to bid against persons who are not buying shares to make a profit, but are basing their share value on keeping golden crab in the ocean. If the value they place on the share were more than the value fishermen can derive from holding the quota, then the price of shares would be higher. The person selling the share would benefit from the higher price. Fishermen wishing to buy shares could be priced out of the market, if there is sufficient demand from other buyers. This is not a likely scenario, especially if constraints are placed on who may purchase shares.

Alternative 1 (No Action) would allow people to hold shares but not use them. The amount of shares that would go unused is expected to be small, unless the cost of harvesting is greater than the revenue received from the catch. Fishermen can either fish the shares themselves or transfer shares to another fisherman to generate revenue. Even when a shareholder is facing some type of physical or mechanical hardship, they would still be allowed to transfer shares to generate revenue. These provisions make it likely that the vast majority of the quota would be harvested if economic incentives exist to do so. However, we assume fisherman would operate to maximize profits. If the golden crab stock decreases to a

level that makes harvesting too costly, fishermen would be expected to leave shares unused. Regulations that would require harvesters to catch their allocation would result in a long-term disruption in the efficient functioning of the market as stocks recover or demand increases. This would result in decreases in producer surplus.

It is not possible to predict if people would purchase shares for some other non-consumptive use. However, if the amount of shares that are purchased and not used is beyond what the Council feels is acceptable, they have the authority to revise the program at a later date to implement a use it or lose it provision.

Alternatives 2 and **3** differ on two dimensions. **Alternative 2** would require shareholders to harvest at least 10% of their annual allocation on average, for any three consecutive year period. **Sub-alternative 2a** would apply the "inactive" definition only to actual landed crabs. **Sub-alternative 2b** would apply the "inactive" definition to any combination of landed crabs and pounds transferred. **Alternative 3** would require shareholders to harvest at least 30% of their annual allocation on average, for any three consecutive year period. **Sub-alternative 3a** would apply the "inactive" definition only to actual landed crabs. **Sub-alternative 3b** would apply the "inactive" definition to any combination of landed crabs and pounds transferred.

Implementing any sub-alternative of **Alternatives 2** or **3** would require buyers of shares to make certain the shares they are buying would not be subject to being revoked after they are purchased. It is possible a person could buy shares and lose them the next year because of this rule. This possibility makes it imperative buyers know the status of share certificates. Tracking the status of share certificates would be done by NOAA Fisheries Service. They would then provide buyers with the status of share certificate before share certificates were transferred. Tracking this additional information would be expected to increase the monitoring cost of the program.

Alternatives 2 and **3** would not prevent individuals from buying shares for the purpose of not harvesting the shares. It would only force the shareowners to fish a portion of their shares each year. If **Sub-alternative 2b** or **3b** is selected, shareholders could meet these harvest requirements by transferring their shares to another fisherman and never actually have to fish themselves. Therefore, the provision may not be totally effective in limiting shareholders to persons wanting to harvest the available resource.

Redistributing inactive shares could benefit members of the fleet that remain active. However, a minimal number of shares are expected to be redistributed among the fleet because of this option. Fishermen that hold share certificates would be expected to sell them before they would allow them to be revoked. Economically, it would not make sense to allow shares to be revoked when they can be sold for approximately the discounted value of future net revenues. Even persons that may buy shares for the purpose of keeping them from being fished would understand the rules for retaining the share certificates. If they did purchase the shares, they would likely devise a strategy that would allow them to be retained. Therefore, it is anticipated few share certificates would be redistributed among the fleet and the economic impacts of the action are expected be minimal.

4.6.3 Social Impacts

The "use or lose" provision is intended to protect active fishermen; prevent shareholders from keeping shares with the intention to lease annual pounds for an extended period of time; and to allow the fishery to achieve maximum harvest by letting the shares be fished. In general, this type of provision is expected to result in broad, long-term social benefits and it would be expected that **Alternative 1 (No Action)** would result in fewer social benefits than **Alternative 2** or **3**.

However, if minimum landings requirements are too rigid, this may have short-term social impacts on business decisions of the golden crab fishermen. **Alternative 2** would provide more flexibility than **Alternative 3** by requiring a lower minimum. **Sub-alternative a** (under **Alternatives 2** and **3**) provides less flexibility than **Sub-alternative b**, and would likely result in fewer social benefits.

4.6.4 Administrative Impacts

Alternative 1 (No Action) would not directly affect the administrative environment. Shares could remain unused and managers would not have to track share usage. The administrative environment could be indirectly affected by a loss in cost recovery fees resulting from unused shares. **Alternatives 2-3** would require administrative tracking of the "expiration date" of unused quota shares, and the average percentage of quota caught for each shareholder. This requirement could directly affect the administrative environment by requiring significant administrative monitoring effort. The differences in the administrative burden between **Alternatives 2-3** are small. Since monitoring of landings would be based on a moving average for all alternatives, administrators would carry out the same tasks for each alternative. The only difference between the two alternatives is that managers may have to revoke shares from more participants under **Alternative 3** than **Alternative 2**, because **Alternative 3** has a higher use requirement. All alternatives would require administrative action to revoke unused quota shares. Losses in cost recovery fees would potentially be greater under **Alternative 2** than **Alternative 3**, because participants would be able to harvest less fish to retain their allotted shares. However, the likelihood shares would remain unused is low given their economic value, and given that expired quota shares would be allocated to someone else, negating any conservation value from "retired" shares.

4.7 Action 7. Cost recovery plan

Alternative 1. No Action. Do not implement a cost recovery plan.

Alternative 2. Alternative 2. Cost recovery fees would be calculated at time of sale at a registered dealer.

> **Sub-alternative** 2a: Cost recovery fees would be based on actual ex-vessel value of landings,

Preferred Sub-alternative 2b: Cost recovery fees would be based on standard ex-vessel value of landings, as calculated by NMFS.

Alternative 3: Fee collection and submission shall be the responsibility of the:
Sub-alternative 3a: Shareholder
Preferred Sub-alternative 3b: Dealer

Alternative 4: Fees submitted to NMFS
Preferred Sub-alternative 4a: Quarterly
Sub-alternative 4b: Monthly
Sub-alternative 4c: Annually

Note: Collected fees shall not exceed 3% of the ex-vessel value of golden crab harvested (MSA Sec 304(d)(2)(B)).

4.7.1 Biological Impacts

Establishing a cost recovery program for a catch share program is an administrative action, which is not expected to affect the program's potential to provide the environmental benefits. None of the cost recovery alternatives are expected to directly or indirectly affect the biological environment.

4.7.2 Economic Impacts

Alternative 1 is inconsistent with direction provided through the Magnuson-Stevens Act. The Magnuson-Stevens Act mandates recovery of actual costs directly related to the enforcement and management of new catch share programs, through a cost recovery fee of up to three percent of the ex-vessel value of fish harvested under the program. If this option were implemented it would not change the producer surplus or net benefits to the Nation.

While **Alternative 1** is inconsistent with the Magnuson-Stevens Act, it is theoretically preferable to the other alternatives if the objective of the program is to achieve maximum economic yield and a socially optimum stock size. Imposing a fee would distort the net benefits and economic impacts of the program and could impact stock size in the long run.

Alternative 2, associated sub-alternatives and options would implement a cost recovery plan, with the cost recovery fee being the responsibility of the shareholder. This cost recovery plan also specifies the calculation of the ex-vessel value as basis for the fee (either as actual or standard ex-vessel value), the fee collection and submission responsibility (either by the shareholder or the dealer), and the timing of fee submission to NOAA Fisheries Service (either quarterly or monthly).

Cost recovery fees would be based on either the actual ex-vessel price paid to the harvester or a "standard" ex-vessel price calculated by NOAA Fisheries Service. Standard prices would be set by specific geographic area based on what NOAA Fisheries Service determines to be appropriate. These prices would be set to reflect changes in prices received in various ports.

If prices are not adjusted by area, and there is variation in the ex-vessel price by port, some harvesters would underpay their actual fee while others would overpay.

If prices are based on the actual ex-vessel payment from the process, NOAA Fisheries Service would need to verify prices that seem too low relative to what other harvesters are paid in the area. Reporting lower prices than were actually received would reduce the cost recovery fee that is paid. Those reports should help verify the actual prices paid to fishermen, and reduce concerns over using accurate prices for determining the fee. Although not necessarily a problem in the short term, the issue of transfer pricing within a vertically integrated firm could eventually arise and could create problems in determining actual ex-vessel value for calculating the fees. Transfer pricing is a common technique used by vertically integrated firms, whereby cost is assigned to the least profitable operation in order to minimize the payment of fees or taxes. Regardless of the method of calculating ex-vessel values, the resulting fee, being the responsibility of the shareholder, would reduce the shareholder's producer surplus.

Whether the fee collection and submission to NOAA Fisheries Service is the responsibility of the shareholder or the dealer and whether the frequency of fee collection and submission is quarterly or monthly, such activity would result in additional bookkeeping and reporting costs. A monthly submission may be expected to result in higher bookkeeping and reporting costs. The amount of those costs would reduce producer surplus for the entities that incur them.

Whether the dealers or the harvesters are required to send the check, the money is expected to come from the harvesters. Dealers would likely hold back the required fee from the payment they make to the harvesters. That money would then be placed in an account and earmarked to pay the fee. Alternatively, NOAA Fisheries Service could bill the harvester directly. Either way the cost recovery fee is actually paid by the harvester and would reduce their producer surplus.

Since dealers/processors incur monetary and non-monetary costs in the cost recovery program, they have the incentive to pass on the cost forward to the next market level (retailers/consumers, for example) or backward to the harvesters. If passed onto the harvesters, dealers may quote lower prices for harvesters or may charge additional "service" fees. Lower prices may in turn result in lower recovery fees. Certainly, there are dealers who have more leverage than others in passing the cost back to harvesters.

4.7.3 Social Impacts

In general, social benefits are associated with lower economic costs for fishermen, and **Alternative 1 (No Action)** would be expected to result in the most social benefits. Although cost recovery is required by the Magnuson-Stevens Act, **Sub-alternatives a** and **b** under **Alternatives 2-4** provide flexibility in how fees are collected by defining how fees are calculated (**Alternative 2**), who collects and submits fees (**Alternative 3**) and timing of fees (**Alternative 4**). **Preferred Sub-alternative 2b** would be expected to have more social benefits than **Sub-alternative 2a** due to a standard and consistent fee schedule for fishermen. **Preferred Sub-alternative 3b** would place the burden of collection and submission on the dealers and **Sub-alternative 3a** would place burden on the fishermen. Lastly, **Preferred Sub-alternative 4a** would reduce the burden on fishermen and dealers in fee submission than **Sub-alternative 4b** and **Sub-alternative 4c**.

4.7.4 Administrative Impacts

The administrative effects of implementing a cost recovery plan are expected to be minimal, in part, because the plan would at least partially pay for itself. **Alternative 1 (No Action)** would require NOAA Fisheries Service assume all costs of administering the proposed catch share program. **Alternative 2** would require NOAA Fisheries Service account for cost recovery fee transactions**. Sub-Alternative 2a**, which requires NOAA Fisheries Service calculate the standard ex-vessel price of golden crab, would be more burdensome than **Sub-alternative 2b,** which would base fees on the actual ex-vessel value of golden crab landings. Because the standard ex-vessel price is based on an average ex-vessel value from the previous year, it is impossible to predict whether the cost recovery fee would be higher or lower if based on the standard ex-vessel price versus the actual ex-vessel value.

Alternatives and associated sub-alternatives considered under **Alternatives 3** and **4**, and associated sub-alternatives pertain to the way and the frequency in which the fees are collected.

4.8 Action 8. Establish boat length limit rule

Alternative 1. No Action. To obtain a permit for the middle or southern zone via transfer, the documented length overall of the replacement vessel may not exceed the documented length overall, or aggregate documented lengths overall, of the replaced vessel(s) by more than 20 percent.

Alternative 2. Eliminate vessel length restrictions for obtaining a permit for the middle and southern zones via transfer.

4.8.1 Biological Impacts

Taking action to modify share allocation among the fishing zones is an administrative action, which is not expected to affect the program's potential to provide the environmental benefits. However, there is some concern that if **Alternative 2** is selected as preferred, most of the fishing effort would occur in the middle and southern zones, increasing the pressure put on the stock.

4.8.2 Economic Impacts

The current regulations regarding **Action 1 (No Action)** (boat length restrictions) were set in Golden Crab Amendment 3. In order "to obtain a permit for the middle or southern zone via transfer, the documented length overall of the replacement vessel may not exceed the documented length overall, or aggregate documented lengths overall, of the replaced vessel(s) by more than 20 percent" (SAFMC 2000). **Alternative 2** proposes to eliminate the vessel size rule.

The size rule was initially put into place to help to keep larger vessels in the northern fishing zones. The middle and southern zones are not as large as the northern zone. It was felt at the time the regulations went into place that the stock in the middle and southern zones could not withstand the pressure of heavy fishing by larger vessels. The current regulations keep larger vessels from replacing smaller ones through permit transfers.

Economically, **Alternative 2** would be better for fishermen because eliminating the boat length rules in the middle and southern zones would allow more fishermen to fish closer to their homeport and therefore reduce trip costs. It is possible that opening up this area to larger vessels might encourage overfishing in these zones. However, if fishing in the middle and southern zones becomes less productive, fishermen are likely to balance the economic benefits of traveling further from their homeport in order to have larger harvests.

4.8.3 Social Impacts

The social benefits of this action are tied to the economic benefits of allowing fishermen to expand operation size by increasing boat size. As the golden crab fishery continues to expand, multi-day trips and larger catches per trip, along with new gear on board to keep crabs alive, may require a larger vessel. Additionally, multi-day trips on larger vessels would be more efficient. Overall, social benefits will be greater with **Alternative 2**, which would allow fishermen to move permits to larger vessels if needed, than for **Alternative 1 (No Action).**

4.8.4 Administrative Impacts

This action would basically eliminate the restriction on upgrading vessel size in the golden crab fishery. This action would require administrative action in the form of rule making, education and outreach. However, the administrative impacts are expected to be reduced from the status quo as it will allow for greater flexibility for the fishermen with less involvement from the regional office and law enforcement.

4.9 Action 9. Restrictions on where permitted vessels can fish for golden crab

Alternative 1. No Action. A vessel with a permit to fish for golden crab in the northern zone or the middle zone may fish only in that zone. No vessel with a documented length overall greater than 65 ft (19.8 m) may fish for golden crab in the small vessel sub-zone within the southern zone. The small vessel subzone is bounded on the north by 24°15' N. lat., on the south by 24°07' N. lat., on the east by 81°22' W. long., and on the west by 81°56' W. long. Upon request from an owner of a permitted vessel, the NMFS Regional Administrator will change the zone specified on a permit from the middle or southern zone to the northern zone. A vessel may possess golden crab only in a zone in which it is authorized to fish, except that other zones may be transited if the vessel notifies NMFS Office for Law Enforcement in advance and does not fish in a zone in which it is not authorized to fish.

Alternative 2. Participants can use quota in any zone for which they possess a permit.

Alternative 3. A vessel with a permit to fish golden crab can use annual pounds in any of the three golden crab fishing zones.

4.9.1 Biological Impacts

Taking action to modify share allocation among the fishing zones is an administrative action, which is not expected to affect the program's potential to provide the environmental benefits. Both **Alternative 2** and **Alternative 3** would allow fishermen flexibility to fish in the zones that they are permitted during one fishing trip. However, there is some concern that if these alternatives are selected as preferred, most of the fishing effort will occur in the middle and southern zones, potentially leading to overfishing of the resource in those areas.

4.9.2 Economic Impacts

Judging by the number of VESIDs (identification numbers issued by the U.S. Coast Guard or states), there have been as many as 36 individual vessels that landed golden crab in all years since 1996, and as many as 16 in one year, but there may be fewer than 3 vessels or dealers with landings from 1, 2 or all 3 fishing zones for golden crab in some years (unpublished, confidential golden crab logbook data, 1997-2010; NMFS, SEFSC, Miami; zones depicted in Figure 3.2). Thus, annual data on landings and fishing activity by zone for most years cannot be published. While there are understood to be 11 permits for fishery, there appear to have been fewer small business entities (independent decision makers; see Section 4.1.2 on SBA definitions of small business entities). For whatever reasons, there appears to have been a relative shift in fishing activity away from the southern zone toward the middle and northern zones during 1997-2010. Recognizing caveats to any statement, the overall cost of fishing for golden crab could be less under **Alternative 3** than under **Alternative** 1 or **Alternative 2**, pending possible clarification in wording of **Alternative 2.** That is, **Alternative 3** would accord more freedom to captains and owners on where to fish and the cost-effective use of vessels. It is noted that the number of vessels with landings of golden crab has fallen since 1997, but this does not appear to be case for the more volatile data on fishing effort, and

CPUE appears to have fallen (see Section 3.4.2). Cost and returns along with logbook data would needed to specify and estimate models of fishing behavior, including shifts in fishing among zones. Information on vessels, and cost and returns is contained in the Golden Crab FMP, 1995, Section 3.5. A cost-and-returns survey is planned (Scott Crosson, NMFS, SEFSC).

4.9.3 Social Impacts

The social benefits of this action are tied to the economic benefits of allowing fishermen to maximize efficiency on each trip, and take advantage of multiple zones on one trip. Social benefits would be expected to be greater under **Alternative 2** than under **Alternative 1 (No Action)**. In regards to **Alternative 3**, which would eliminate the small vessel zone, social benefits would be expected due to harvesters having the opportunity to fish an area that is no longer used by small vessels.

4.9.4 Administrative Impacts

There would be minor administrative impacts associated with the action alternatives. These impacts would be related to outreach, education and rulemaking. However, the administrative impacts are expected to be reduced from the status quo as it will allow for greater flexibility for the fishermen with less involvement from the regional office and law enforcement.

4.10 Action 10 Modify the small vessel sub-zone restriction

Alternative 1. No Action. Do not eliminate the small vessel sub-zone within the southern zone that was originally established to protect against very large vessels fishing in the subzone.

Alternative 2. Eliminate the small vessel sub-zone within the southern zone that was originally established to protect against very large vessels fishing in the subzone

4.10.1 Biological Impacts

Taking action to eliminate the small vessel sub-zone is not expected to affect the program's potential to provide the environmental benefits. However, under **Alternative 2**, there is the potential for localized depletion of golden crabs in that particular area if larger vessels decide to relocate their fishing operations there.

4.10.2 Economic Impacts

4.10.3 Social Impacts

4.10.4 Administrative Impacts

The action to eliminate the small vessel sub-zone would not result in administrative impacts other than those associated with rule-making. Enforcement impacts would be reduced as the elimination of this sub-zone would allow all vessels to fish in this area.

4.11 Action 11: Establish criteria for permit stacking

Alternative 1. No Action. Do not allow stacking of permits.

Alternative 2. Allow for stacking of up to three permits on one vessel so that any zones for which the vessel has a permit can be fished in one trip.

Alternative 3. Allow an unlimited amount of golden crab permits on a single vessel so that any zones for which the vessel has a permit can be fished in one trip.

4.11.1 Biological Impacts

This action is primarily administrative and would not have any direct effects on the biological environment. **Alternative 1** (**No Action**), would not affect the fishery as it is currently prosecuted; therefore, this alternative should have no effect on the physical environment. **Alternative 2** and **Alternative 3** would allow vessels to fish multiple zones in one trip. It is not expected that this alterative would cause impacts to the biological environment.

4.11.2 Economic Impacts

Judging by the number of VESIDs (identification numbers issued by the U.S. Coast Guard or states), there have been as many as 36 individual vessels that landed golden crab in all years since 1996, and as many as 16 in one year, but there may be fewer than 3 vessels or dealers with landings from 1, 2 or all 3 fishing zones for golden crab in some years (unpublished, confidential golden crab logbook data, 1997-2010; NMFS, SEFSC, Miami; zones depicted in Figure 3.2). Thus, annual data on landings and fishing activity by zone for most years cannot be published. While there are understood to be 11 permits for fishery, there appear to have been fewer small business entities (independent decision makers; see Section 4.1.2 on SBA definitions of small business entities). For whatever reasons, there appears to have been a relative shift in fishing activity away from the southern zone toward the middle and northern zones during 1997-2010. Recognizing caveats to any statement, the overall cost of fishing for golden crab could be less under **Alternative 3** than under **Alternative** 1 or **Alternative 2**, pending possible clarification in wording of **Alternative 2.** That is, **Alternative 3** would accord more freedom to captains and owners on where to fish and the cost-effective use of vessels. It is noted that the number of vessels with landings of golden crab has fallen since 1997, but this does not appear to be case for the more volatile data on fishing effort, and CPUE appears to have fallen (see Section 3.4.2). Cost and returns along with logbook data would needed to specify and estimate models of fishing behavior, including shifts in fishing

among zones. Information on vessels, and cost and returns is contained in the Golden Crab FMP, 1995, Section 3.5. A cost-and-returns survey is planned (Scott Crosson, NMFS, SEFSC).

4.11.3 Social Impacts

The social benefits of this action are tied to the economic benefits of allowing fishermen to maximize efficiency on each trip, and take advantage of multiple zones on one trip by obtaining multiple permits on a vessel. Social benefits would be expected to be greater under **Alternative 2** and **Alternative 3** than under **Alternative 1 (No Action)**.

4.11.4 Administrative Impacts

This action is primarily an administrative in nature. **Alternative 1**, no action, would not increase or decrease the administrative burden managing the golden crab fishery. **Alternative 2** and **Alternative 3** would initially adversely affect the administrative environment because permit histories would need to be combined as some permit holders request their permits to be stacked. However, this may provide a long-term benefit to the administrative environment because the number of permits would decrease. This would reduce administrative efforts needed for permit renewal and communicating with fishermen through Fishery Bulletins.

4.12 Action 12. Monitoring and enforcement

Alternative 1. No Action. Do not require additional monitoring and enforcement.

Alternative 2. Require all fishing vessels permitted in the golden crab catch share program to be equipped with VMS. The purchase, installation, and maintenance of VMS equipment must conform to the protocol established by NMFS in the Federal Register.

Sub-alternative 2a. The purchase, installation, and maintenance of the VMS equipment and communications costs will be paid for or arranged by the shareholder.

Sub-alternative 2b. The purchase of the VMS equipment will be paid for by NMFS and the installation, maintenance, and communications costs of the VMS equipment will be paid for or arranged by the shareholder.

Sub-alternative 2c. The purchase of VMS equipment will be reimbursed by the National OLE VMS reimbursement account if funding is available. Installation, maintenance, and communication costs will be paid for or arranged by the shareholder.

Note: The Council may want to consider **i**mplementing a hail-in requirement (at least 3 hrs ahead of time whereby a message could be left or texted in excess of 3 hours) when landing with location and time or other information deemed necessary by enforcement.

4.12.1 Biological Impacts

Alternative 1 (No action) would not require a vessel monitoring system (VMS) on golden crab vessels participating in the catch share program. VMS is typically used in conjunction with catch share programs to identify when fishermen are fishing and when they are returning to port. During the development of the Comprehensive Ecosystem-Based Amendment 1, the use of VMS for the golden crab fishery was explored. It was been determined by the Office of Law Enforcement (OLE) that VMS is not an effective tool to monitor the location of golden crab fishing gear. However, OLE supports the use of VMS to monitor who is fishing and when fishing vessels are returning to port.

Alternative 2 and associated sub-alternatives would require VMS on golden crab vessels participating in the catch share program. These alternatives would not result in biological impacts as the alternatives are more administrative and would have economic and social impacts.

4.12.2 Economic Impacts

Alternative 1 (No action) would not require use of an approved VMS by any vessel participating in the golden crab catch shares program. The Comprehensive Ecosystem-Based Amendment 1 explored the idea of VMS for the golden crab fishery but after many discussions with the fishery participants and law enforcement, it was determined that VMS is not an effective tool to monitor the location of golden crab fishing gear. However, catch share programs used VMS to monitor when fishing vessels are returning to port. All catch share programs in the South Atlantic require the use of VMS and under this alternative the golden crab fishery would not be required to have VMS systems onboard.

Alternative 2 and associated **Sub-alternatives 2a-2c** would require the use of VMS for vessels fishing in the golden crab catch share program. The sub-alternatives vary the way the VMS would be paid for. **Alternative 2, Sub-alternative 2a, 2b, 2c** would result in increased costs to golden crab fishermen. Under **Alternative 2, Sub-alternative 2c** the initial purchase would be the responsibility of NOAA Fisheries Service and would not result in an increased cost to the golden crab fishermen, except for the installation, maintenance, and communication. However, some fishermen may consider the requirement of a VMS to be an intrusion on their privacy and their autonomy as an independent fisherman.

If government funds were made available **(Sub-alternative 2b)** to cover the costs of VMS units, there would still be ongoing costs associated with maintenance and operation of the VMS units. There are eleven currently active permits in the golden crab fishery. Of these, seven permits have landed at least 1,000 pounds of golden crab sometime between 2005 and 2007. Therefore, if those permits remained active and continued to fish, seven permits would require installation of VMS units under **Alternative 2.**

The VMS unit costs differ depending on the model purchased. The NMFS-approved VMS unit costs are shown in **Table 4-6**.

Table 4-7. NMFS-approved VMS units and costs.

Brand and Model	Cost
Boatracs FMCT-G	$3095
Thrane and Thrane TT-3026D	$3595
Faria Watchdog KTW304	$3295

Source: Data provided by NMFS Office of Law Enforcement, July 2008.

The current reimbursement amount from NOAA Fisheries Servie for the Highly Migratory Species (HMS) and rock shrimp fisheries for purchase of a VMS unit is $3,100.

The VMS regulations changed in 2008 and now only authorize the purchase of Enhanced Mobile Transmitting Units (EMTU). These are VMS units that have a computer screen which enables the fishermen to submit any forms. Previously, HMS and rock shrimp vessel owners were able to purchase "pingers" only which were half the cost of these newer units. All fisheries are now required to comply with the new EMTU requirements and those estimated costs are provided in **Table 4-7**.

If all seven vessels were outfitted with VMS units, the total cost to the fishery to purchase the seven units would range from $21,665 to $25,165. If reimbursements were issued, the aggregate cost of unit purchase to the fishery would range from $0 to $3,465. Individually, this results in $0 to $495 per vessel. The cost to Federal management would be $21,700. However, this does not include the cost of installation or maintenance. While installation costs are approximately $300 per unit, maintenance costs cannot be estimated with existing information. Communication costs for each of the models which average from $30 to $80 per month are provided in **Table 4-8**.

Table 4-8. NMFS-approved VMS communications costs.

1. Qualcomm (for Boatracs units)
\$30/mo satellite fee, \$.30/message, \$.006 per character for messaging (average price \$80/month which includes 24/7 operations center support)
2. Telenor (for Thrane units)
\$.06 per position report or \$1.44 per day for 1 hour reporting. If in the "In Harbor" mode, then \$.36 per day. Messaging costs \$.24 per e-mail. (\$30/mo average)
3. Xantic (for Thrane units)
\$.06 per position report or \$1.44 per day for 1 hour reporting. If in the "In Harbor" mode, then \$.36 per day. Messaging costs \$.22 per message and \$.22 per e-mail. (\$35/mo average)
4. Iridium/Cingular Wireless (for Faria units)
\$44.95 per month which includes 4,000 Iridium bytes and 35,000 GSM bytes for email and e-forms reporting.

Source: Data provided by NMFS Office of Law Enforcement, July 2008.

The annual aggregate costs of implementing VMS under **Alternatives 2 and associated sub-alternatives** assuming management does not help subsidize the cost of the VMS units is summarized in **Table 4-9** and the annual aggregate costs of implementing VMS under **Alternatives 2** assuming management helps subsidize the cost of the VMS units is summarized in **Table 4-10**.

Table 4-9. Summary of annual costs to fishermen of implementing Alternatives 3 assuming VMS unit cost is not subsidized[1].

Alternatives	**Total VMS Purchase Cost**	**Total Installation Cost**	**Total Annual Maintenance Cost**	**Total Annual Communication Cost**	**Total Cost**[2]
Alternative 2					
First year	\$21,665-\$25,165	\$2,100	Unknown	\$2,520-\$6,720	\$26,285-\$33,985+ maintenance cost
Subsequent years	NA	NA	Unknown	\$2,520-\$6,720	\$2,520-\$6,720+ maintenance cost
Alternative 3					
First year	\$34,045-\$39,545	\$3,300	Unknown	\$3,960-\$10,560	\$41,305-\$53,405+ maintenance cost
Subsequent years	NA	NA	Unknown	\$3,960-\$10,560	\$3,960-\$10,560+ maintenance cost

Note 1: This table assumes that the VMS unit cost is not subsidized by management under **sub-alternative 3b**

Note 2: The Total Cost column uses the lower Unit Cost and lower Communication Cost estimates to calculate the value at the lower end of the range. Likewise, the Total Cost column uses the higher Unit Cost and higher Communication Cost estimates to calculate the value at the lower end of the range.
Note 3: These costs do not include the incremental administrative costs associated with data collection, employees, function, and maintenance of the VMS system for the golden crab fishery.

Table 4-10. Summary of annual costs to fishermen of implementing Alternatives 2 and 3 assuming VMS unit cost is subsidized[1].

Alternatives	Unit Cost (fishermen/ management)	Implementation of Unit (fishermen)	Unit Maintenance (fishermen)	Communication Costs (fishermen)	Total Cost (fishermen/ management)[2]
Alternative 2					
First year	($0-$3,465)/ ($21,700)	$2,100	Unknown	$2,520-$6,720	$4,620-$12,285 + maintenance cost
Subsequent year	NA	NA	Unknown	$2,520-$6,720	$2,520-$6,720 + maintenance cost
Alternative 3					
First year	($0-$5,445) ($34,100)	$3,300	Unknown	$3,960-$10,560	$7,260-$13,860 + maintenance cost
Subsequent year	NA	NA	Unknown	$3,960-$10,560	$3,960-$10,560 + maintenance cost

Note 1: This table assumes that the VMS unit cost is subsidized by management under **sub-alternative 3b**
Note 2: The Total Cost column uses the lower Unit Cost and lower Communication Cost estimates to calculate the value at the lower end of the range. Likewise, the Total Cost column uses the higher Unit Cost and higher Communication Cost estimates to calculate the value at the lower end of the range.
Note 3: This $0 estimate does not account for the fact that management may subsidize VMS units that need replacement. It is not possible to make an estimate as to how many units may need replacement at this time.
Note 4: These costs do not include the incremental administrative costs associated with data collection, employees, function, and maintenance of the VMS system for the golden crab fishery.

If the fleet pays the cost of VMS **(Sub-alternative 2a),** the producer surplus would be expected to decrease by the variable component of the total VMS costs, since VMS is expected to neither increase revenue nor decrease fishing costs not associated with the VMS. If NOAA Fisheries Service pays for the cost of the VMS (**Sub-alternative 2b, 2c**) it would not change producer surplus because transfer payments are excluded from the calculation.

Alternative 2 would require use of an approved VMS by any vessel fishing with a limited access golden crab permit in the South Atlantic Council's area of jurisdiction. **Alternative 2** and associated sub-alternatives would result in increased costs to all golden crab fishermen unless government funding was used to subsidize those costs. **Sub-alternatives 2b** and **2c** provide would subsidize the purchase of the units but would not remove all costs from the fishermen. There are eleven currently active permits in the golden crab fishery. Under **Alternative 2**, all eleven vessels would be required to install VMS units on their vessels to remain active.

The costs of implementing VMS under **Alternatives 2 and associated sub-alternatives** are summarized in **Table 4-9**.

If all eleven vessels purchased VMS units, the cost would range from $34,045 to $39,545. If reimbursements were issued, the aggregate cost to the fishery would be from $0 to $5,445 (**Table 4-10**). The average cost to the 11 fishermen would be $495. The cost to management would be $34,100. However, this does not include the cost of installation or maintenance. While installation costs approximate $300 per unit, maintenance costs cannot be estimated with existing information. Communication costs for each of the models are provided in **Table 4-7**.

4.12.3 Social Impacts

This action is primarily administrative, but there are social benefits associated with improved monitoring programs. Overall, the proposed measures may impose some additional burdens on fishermen, administrators, and law enforcement, but negative impacts would be outweighed by the social benefits of improved monitoring through electronic reporting, VMS use, and hail-in requirements. The proposed measures in this action would improve data for the golden crab fishery, and this would generate broad long-term social benefits. **Alternative 1 (No Action)** would not produce any social costs or benefits due to no change in the current requirements for the golden crab fishery. **Alternative 2** would have some short-term social impacts, such as fishermen possibly needing to purchase and learn to use new equipment, but there would also likely be long-term social benefits from improved and timely data collection. **Alternative 2** and **Sub-alternatives 2a-2c** requires VMS and designates financial responsibility for associated costs. In general, lower costs for fishermen are associated with social benefits, and **Sub-alternative 3b** would be expected to produce the most social benefits by not contributing to fishing costs. The hail-in requirement proposed in **Alternative 3** will likely produce long-term social benefits by improving enforcement and monitoring for the golden crab fishery.

4.12.4 Administrative Impacts

Alternative 1 (No action) would produce no increased administrative cost or burden beyond the status-quo. **Alternatives 2** and associated sub-alternatives would require the use of vessel monitoring on federally permitted golden crab vessels participating in the golden crab fishery. During the development of the Comprehensive Ecosystem-Based Amendment 1, it was determined that VMS is not an appropriate monitoring mechanism for the golden crab fishery. Requiring VMS for the catch share program may result in an increased enforcement burden due to the need for increased training for the VMS personnel and the increased possibility of unnecessary at-sea enforcement.

The most problematic issue related to the use of VMS in this fishery is born from environmental and mechanical variables that often lead to a great distance between the gear itself and the vessel during both deployment and haul back. The combination of current and

depth cause the gear to be as far away from the vessel as one and one half miles. This unavoidable aspect of golden crab fishing would create scenarios in which the vessel itself is located outside the allowable area but within protected Coral Habitat Areas of Particular Concern, while that vessel's gear is located within the allowable area. Since the VMS unit would be located on the vessel and not the gear, a violation would be incurred and would require OLE to process citations, thus adding to their administrative burden. Additionally, the irregular and sometimes very narrow shape of the proposed allowable golden crab fishing areas would compound the difficulty of utilizing VMS as a fishery monitoring tool and successfully prosecuting violations.

However, VMS is an important tool used in monitoring of catch share programs and is strongly encouraged by the OLE as a tool used in this fishery. The administrative impacts associated with the action alternatives are associated with rule-making, outreach, monitoring and enforcement. These impacts are expected to be significant on the agency.

4.13 Action 13. Establish criteria for new entrants program

Alternative 1. No Action. Do not create provisions that assist new entrants in entering the fishery.

Alternative 2. Set aside some amount of annual pounds for new entrants when quota is: (i) released as a part of a violation, (ii) lost quota (use it or lose it provision); and (iii) when the ACL exceeds 3 million pounds.

Alternative 3. Set aside 2% of the golden crab ACL each year to be auctioned off to permit holders that do not possess shares.

Alternative 4. Set aside 5% of the golden crab ACL each year to be auctioned off to permit holders that do not possess shares.

Alternative 5. Set aside 10% of the golden crab ACL each year to be auctioned off to permit holders that do not possess shares.

4.13.1 Biological Impacts

Establishing a new entrants program would allow a mechanism for new entrants to participate in the fishery. This program would be an administrative change and would not be expected to result in biological impacts to the resource as the harvest of golden crabs is constrained by an ACL.

4.13.2 Economic Impacts

Unless the Council chooses **Alternative 3** as their preferred alternative for **Action 4**, under **Alternative 1 (no action)** there would be no way for new entrants to come into the fishery. **Action 13** provides four methods for new entrants to enter. **Alternative 2** would allow

entrants to come in through shares taken as part of a violation, revoked through the "use it or lose it" provision (**Action 6**), or should the ACL reach 3 million pounds. **Alternatives 3 through 5** would set aside 2%, 5%, or 10% of the shares (respectively) to be made available to new entrants through an annual auction.

It is likely that **Alternative 2** would have relatively little negative economic impact on the current fishery participants. However, **Alternatives 3** through **5**, depending on the alternative selected, could have an adverse impact on current participants as they would have their annual share allocations reduced by the amount of the selected alternative.

Alternative 2 does not describe how shares taken through violations, revoked through the "use it or lose it" provision, or an ACL exceeding 3 million pounds would be distributed to new participants. Therefore, it is impossible to determine how new participants would be economically impacted, positively or negatively under this alternative. **Alternatives 3** through **5** indicate that the percent of shares set aside each fishing year would be sold off at auction. The costs to new entrants would be the price they would have to pay for each share and that amount would vary by fisherman depending on the price paid per share and the number of shares purchased.

4.13.3 Social Impacts

In most cases, implementation of a new catch share program results in additional capital required for new entrants, which may impact fishing communities and affect the continuation of intergenerational fishing in families (Buck 1995; McCay 2004). Therefore, program provisions, such as set-asides, that assist new entrants in accessing shares would be expected to produce broad, long-term social effects. **Alternative 1** would not be expected to produce any social benefits, but may impact new entrants and the fishery overall if there are too few fishermen. The set-asides proposed in **Alternatives 2-5** would provide shares for new entrants without affecting current participants, particularly because the ACL for golden crab is much higher than current landings. In general, the more access to shares that is provided for new entrants, the more overall and long-term social benefits. In this way **Alternative 5** would likely produce the most social benefits by setting aside the highest percentage of shares for new entrants, as long as new entrants used the shares for harvest.

4.13.4 Administrative Impacts

The establishment of a new entrants program as described in the action alternatives would be administratively burdensome. Depending on how the program is structured, there would need to be staff available to manage the program.

4.14 Action 14. Annual pounds overage

Alternative 1. No Action. Do not allow fishermen to exceed their allotted annual pounds.

Alternative 2. A person on board a vessel with the shareholder's only remaining golden crab annual pounds may exceed, by up to 10%, the shareholder's annual pounds remaining on the last fishing trip of the year. Shareholders who incur an overage will be required to payback the annual pounds overage in the subsequent fishing year.

Alternative 3. A person on board a vessel with the shareholder's only remaining golden crab annual pounds may exceed, by up to 20%, the shareholder's annual pounds remaining on the last fishing trip of the year. Shareholders who incur an overage will be required to payback the annual pounds overage in the subsequent fishing year.

4.14.1 Biological Impacts

The annual pounds overage action would allow fishermen to exceed their annual pounds during the last trip of the fishing year but repay their overage in the following fishing year. This action is not expected to have a biolgocial impact as the overage will be addressed in the following fishing year.

4.14.2 Economic Impacts

The purpose of **Action 14** is to provide potential economic relief for fisherman and to prevent wasting golden crab biomass. **Alternative 1 (no action)** would require fishermen to stop fishing exactly when their quota share was reached. However, **Alternatives 2** and **3** would allow a fisherman who goes over his or her share on the last trip of the season to exceed the allowed quota share by either 10 or 20%. Any average would come off of that fisherman's next fishing year's share allocation. Allowing the fisherman flexibility would improve a fisherman's profit margin compared to trip costs on the last trip of the year. The economic downside of selecting **Alternative 2** or **3** would be that any overage would reduce the following year's allocation; therefore, potential earnings from that year might be reduced, as well.

4.14.3 Social Impacts

The social benefits of allowing an overage for the last trip of the season are associated with the economic benefits of this type of provision. **Alternative 1 (No Action)** would likely not produce any social benefits by not allowing overage, but could negatively impact fishermen by causing early termination of a trip. **Alternatives 2** and **3** would likely be beneficial to the fishermen and allow them to maximize efficiency on the last trip of the year. However, if overages occurred commonly and over several years, this could affect fishermen through management measures if the ACL is exceeded.

4.14.4 Administrative Impacts

The action alternatives would have some administrative burden associated with tracking the overage against the following year's quota. However, it is expected that this type of overage will be built into the computerized system and will not require large amounts of staff time

during the implementation phase. There would be no difference in the administrative burden between **Alternatives 2** and **3**.

4.15 Action 15. Approved landing sites

Alternative 1. No Action. Do not establish approved landing sites for the golden crab catch share program.

Alternative 2. Modify Alternative 2 to read: Establish approved landing sites for the golden crab catch share program. All participants must land at an approved landing site to participate in the program.

Preferred Sub-alternative 2a. Approved landing sites will be selected by fishermen but must be approved by NMFS Office of Law Enforcement (OLE) in consultation with the appropriate state law enforcement agency prior to use.

Sub-alternative 2b. Approved landings sites will be selected by the Council and NMFS in consultation with the appropriate state law enforcement agency, based on industry recommendations and resource availability.

4.15.1 Biological Impacts

Establishing approved landing sites is an administrative action. Therefore, is not expected to directly or indirectly affect the physical, biological or ecological environments in a positive or negative way.

4.15.2 Economic Impacts

Alternative 1 (No Action) would not require certification of landing sites, and thus this alternative would not result in any additional cost. Were it to become the case that many landing sites are either not readily identified or inaccessible to law enforcement officers, the likelihood of not properly monitoring the catch share system would increase. This could eventually be disruptive to the proper functioning of the system, which in turn could reduce the economic benefits from the program.

Alternative 2 and associated sub-alternatives would establish landing sites for all catch share programs in the commercial golden crab fishery. The cost for certifying a landing site is reportedly minimal for both the fishing participants and fishery managers, including enforcement personnel. If such were the case, whatever benefits gained from properly enforcing landing/offloading rules would enhance the benefits from the catch share system. One possible negative feature of this option is that fishermen may have to incur more travel and other costs if they are compelled to land their fish in other places far removed from their usual landing sites. Naturally, this would happen only if their usual landing sites could not be approved and this would be minimized under **Sub-alternative 2a.**

4.15.3 Social Impacts

In general, measures that contribute to improved monitoring and enforcement are expected to produce broad, long-term social benefits, and potentially some short-term social impacts associated with any economic costs from the proposed requirements. It is likely that designated landings sites will contribute to improved monitoring and data collection, and **Alternative 1 (No Action)** would likely not produce any of these long-term social benefits. **Alternative 2** and **Sub-alternatives 2a** and **2b** would implement landing site designations and produce social benefits through improved monitoring. The flexibility in **Sub-alternative 2a** would have fewer impacts on fishermen by eliminating the possibility that harvesters would have to change landings sites under **Sub-alternative 2b**.

4.15.4 Administrative Impacts

Alternative 1 (No Action) would be the least burdensome on the administrative environment because approved landing sites would not be established. Establishing approved landings is expected to be more burdensome on the administrative environment than status quo because NMFS OLE has to approve sites, which includes visiting sites to ensure addresses are valid. Additionally, approved landings sites will have to be tracked and updated as needed and VMS landing notification forms would need to be updated if approved sites change.

4.16 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.

4.16.1 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**). 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 ecosystems identified in **Section 3.0**.

3. Establish the timeframe for the analysis.

It would be advantageous to go back to a time when there was a natural, or some modified (but ecologically sustainable) condition. However, data collection for many fisheries began when species were already fully exploited. Therefore, the timeframe for any analysis should be initiated when data collection began for the subject fishery. In determining how far into the future to analyze cumulative effects, the length of the effects would depend on the species. This amendment would…

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 golden crab.

A. Past

The reader is referred to **Section 1.3 History of Management** for past regulatory activity for golden crab.

B. Present

In this amendment the Council has recommended:

B. Reasonably Foreseeable Future

II. Non-Council and other non-fishery related actions, including natural events affecting deepwater coral, shrimp, and golden crab.

A. Past
B. Present
C. Reasonably foreseeable future

AFFECTED ENVIRONMENT

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

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

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

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.

The relationship between human activities and biophysical ecosystems within the context of this amendment is solely related to extractive activities and the installment of regulations as outlined in **Table 4-X**.

9. Determine the magnitude and significance of cumulative effects.

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

The cumulative effects on the biophysical environment are expected to be negligible. Therefore, avoidance, minimization, and mitigation are not necessary.

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

The effects of the proposed action are, and will continue to be, monitored through collection of data by NOAA Fisheries Service, states, stock assessments, stock assessment updates, life history studies, and other scientific observations.

4.16.2 Effects on protected species

ESA-listed species that occur within areas where the action area would be located and that may be impacted by unrelated, future, non-federal activities reasonably certain to occur within the action area include:

Marine Mammals

Sea Turtles

Fish

4.16.3 Socioeconomic

A description of the human environment and associated key fishing communities is contained in **Section 3.4** and incorporated herein by reference.

4.16.4 Administrative

4.17 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.

4.17.1 Population Effects for the Bycatch Species

4.17.1.1 Background

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

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

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

4.17.4 Effects on Marine Mammals and Birds

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

4.17.6 Changes in Fishing Practices and Behavior of Fishermen

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

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

4.17.9 Changes in the Distribution of Benefits and Costs

4.17.10 Social Effects

The Social Effects of the proposed management measures are described in **Section 4.0**.

4.17.11 Conclusion

4.18 Unavoidable Adverse Effects

4.19 Effects of the Fishery on the Environment

4.19.1 Effects on Ocean and Coastal Habitats

4.19.2 Public Health and Safety

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

4.19.3 Endangered Species and Marine Mammals

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

4.21 Irreversible and Irretrievable Commitments of Resources

4.22 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 golden crab fishery. 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

The purpose and need, issues, problems, and objectives of the proposed amendment are presented in **Section 1.0** and are incorporated herein by reference. In summary, the purpose of this amendment includes implementing a catch share program for the golden crab fishery, including establishment of criteria for eligibility, allocate privileges, establish a cap on privilege ownership, and devise methods for cost recovery.

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

Details on the economic impacts of all alternatives are included in **Section 4.0** and are included herein by reference. The following discussion provides a summary of the expected effects of the preferred alternatives.

5.6 Public and Private Costs of Regulations

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

Council costs of document preparation, meetings, public hearings, and information dissemination	$
NOAA Fisheries administrative costs of document preparation, meetings and review	$
Annual law enforcement costs	unknown
TOTAL	$

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

5.7 Summary of Economic Impacts

5.8 Determination of Significant Regulatory Action

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

The purpose and need, issues, problems, and objectives of the proposed rule are presented in **Section 1.0** and are incorporated herein by reference. The purpose and need, issues, problems, and objectives of the proposed amendment are presented in **Section 1.0** and are incorporated herein by reference. In summary, the purpose of this amendment includes implementing a catch share program for the golden crab fishery, including establishment of criteria for eligibility, allocate privileges, establish a cap on privilege ownership, and devise methods for cost recovery.

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

No duplicative, overlapping, or conflicting Federal rules have been identified.

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

This proposed action is expected to directly impact commercial fishermen. The SBA has established size criteria for all major industry sectors in the U.S. including fish harvesters. A business involved in fish harvesting is classified as a small business if it is independently owned and operated, is not dominant in its field of operation (including its affiliates), and has combined annual receipts not in excess of $4.0 million (NAICS code 114111 and 114112, finfish and shellfish fishing) for all its affiliated operations worldwide.

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

The proposed actions do not impose any new reporting, record-keeping or other compliance requirements.

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 ethnographies 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.

The Council conducted XX scoping meetings for this amendment in which the public was invited to provide input on actions contained therein. Comments received were considered during the development of this amendment, and no environmental justice issues were raised during the scoping process. No Native American programs would be affected by actions contained within this amendment; therefore no tribal consultation has been initiated.

8 Other Applicable Law

8.1 Administrative Procedures 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 the golden crab fishery and 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.

8.6 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 fishery participants regardless of race or income.

8.7 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.

8.8 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.

8.9 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.

8.10 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.

8.11 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.

8.12 National Environmental Policy Act

This amendment to the South Atlantic Golden Crab FMP has been written and organized in a manner that meets NEPA requirements, and thus is a consolidated NEPA document, including a draft 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.**

8.13 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.

8.14 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.

8.15 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**.

8.16 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.

8.17 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

Karla Gore	Fishery Biologist	NMFS	
Kari MacLauchlin	Fishery Social Scientist	SAFMC	
Brian Chevrount	Economist	SAFMC	
Jack McGovern			

Golden Crab Interagency Planning Team/Reviewers

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

Responsible Agency

Amendment:

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

Environmental Assessment:

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

List of Agencies, Organizations, and Persons Consulted

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

11 References

Acropora Biological Review Team. 2005. Atlantic *Acropora* Status Review Document. Report to National Marine Fisheries Service, Southeast Regional Office, March 3. 152 p + App.

GMFMC (Gulf of Mexico Fishery Management Council) and South Atlantic Fishery Management Council. 1982. Fishery Management Plan and Final Environmental Impact Statement for Coral and Coral Reefs of the Gulf of Mexico and South Atlantic. Gulf of Mexico Fishery Management Council, 5401 West Kennedy Boulevard, Suite 881, Tampa, Florida. 316 pp.

GMFMC (Gulf of Mexico Fishery Management Council) and South Atlantic Fishery Management Council. 1990. Amendment 1 and Final Environmental Impact Statement for Coral and Coral Reefs of the Gulf of Mexico and South Atlantic. Gulf of Mexico Fishery Management Council, 5401 West Kennedy Boulevard, Suite 881, Tampa, Florida.

GMFMC (Gulf of Mexico Fishery Management Council) and South Atlantic Fishery Management Council. 1994. Amendment 2 and Final Environmental Impact Statement for Coral and Coral Reefs of the Gulf of Mexico and South Atlantic. Gulf of Mexico Fishery Management Council, 5401 West Kennedy Boulevard, Suite 881, Tampa, Florida. 316 pp.

GMFMC (Gulf of Mexico Fishery Management Council). 1995. Amendment 8 to the fishery management plan for the shrimp fishery of the Gulf of Mexico. Gulf of Mexico Fishery Management Council, 5401 West Kennedy Boulevard, Suite 881, Tampa, Florida.

GMFMC (Gulf of Mexico Fishery Management Council). 2005a. Final Amendment Number 13 to the Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, U.S. Waters. Available at: http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/shrimp%20Amend%2013%20Final%.pdf

GMFMC (Gulf of Mexico Fishery Management Council). 2005b. Shrimp Amendment 13 FAQs. Available at: http://www.gulfcouncil.org/Beta/GMFMCWeb/Shrimp12FAQs.htm

Jaap, W. C., W. G. Lyons, P. Dustan, and J. C. Halas. 1989. Stony coral (Scleractinia and Milleporina) community structure at Bird Key Reef, Ft. Jefferson National Monument, Dry Tortugas, Florida. Florida Marine Research Publication 46: 31.

Jensen, A. and R. Frederickson. 1992. The fauna associated with the bank-forming deepwater coral *Lophelia pertusa* (Scleractinia) on the Faroe Shelf. Sarsia 77: 53-69.

Keinath, J. A. and J. A. Musick. 1993. Movements and diving behavior of a leatherback sea turtle, *Dermochelys coriacea*. Copeia, 1993:1010.

Keiser, R. K. 1976. Distribution of the Rock Shrimp (*Sycionia brevirostris*) in coastal waters of the southeastern United States. South Carolina Marine Resources Research Institute, Charleston, SC. 19 p.

Kendall, D. 1990. An Assessment of the Georgia golden crab fishery. Pages 18-19 *In*: Lindberg, W. J. and E. L. Wenner (eds.). 1990. Geryonid Crabs and Associated Continental Slope Fauna: A Research Workshop Report. S.C. Sea Grant Consortium and FL Sea Grant College Program. FL SG Technical Paper 58:61 pp.

Kennedy F. S., J. J. Crane, R. A. Schlieder, and D. G. Barber. 1977. Studies of the rock shrimp, *Sycionia brevirostris*. A new fishery on Florida's Atlantic Shelf. Florida Department of Natural Resources, Marine Research Laboratory, St. Petersburg, FL. 69 p.

Koenig, C. C. 2001. Oculina Banks: habitat, fish populations, restoration and enforcement. Report to the South Atlantic Fishery Management Council available at http://www.safmc.net

Koslow, J. A., G. W. Boehlert, J. D. M. Gordon, R. L. Haedrich, P. Lorance, and N. Parin. 2000. Continental slope and deep-sea fisheries: implications for a fragile ecosystem. ICES Journal of Marine Science 57: 548–557.

Krieger, K. J. and B. L. Wing. 2002. Megafaunal associations with deepwater corals (*Primnoa* spp.) in the Gulf of Alaska. Hydrobiologia 471:83-90.

Lanyon, J. M., C. J. Limpus, and H. Marsh. 1989. Dugongs and turtles: grazers in the seagrass system. *In*: Larkum, A.W.D, A. J. McComb and S. A. Shepard (eds.). Biology of Seagrasses. Elsevier, Amsterdam, 610p.

Leeworthy, V. S., and P. C. Wiley. 2002. Socioeconomic impact analysis of marine reserve alternatives for the Channel Islands National Marine Sanctuary. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service, Special Projects, Silver Spring, MD.

Lewis, J. B. 1977. Suspension feeding in Atlantic reef corals and the importance of suspended particulate matter as a food source. Proceedings of the 3rd International Coral Reef Symposium 1:405-408.

Limpus, C. J. and N. Nichols. 1988. The southern oscillation regulates the annual numbers of green turtles (*Chelonia mydas*) breeding around northern Australia. Australian Journal of Wildlife Research, 15:157.

Limpus, C. J. and N. Nichols. 1994. Progress report on the study of the interaction of El Niño Southern Oscillation on annual *Chelonia mydas* numbers at the southern Great Barrier Reef rookeries. *In*: Proceedings of the Australian Marine Turtle Conservation Workshop, Queensland, Australia.

Lindberg, W. J., N. J. Blake, H. M. Perry, R. S. Waller, F. D. Lockhart, and R. B. Erdman. 1989. Fisheries development of the deep-sea golden crab, *Geryon fenneri*: Geographic and seasonal production potential in the Gulf of Mexico. Final Project Report. Marine Fisheries Initiation Program, National Marine Fisheries Service, 98pp.

Lindberg, W. J. and F. D. Lockhart. 1993. Depth-stratified population structure of Geryonid crabs in the eastern Gulf of Mexico. Journal Crustacean Biology 13(4): 713-732.

Low, R. N. and G. F. Ulrich. 1983. Deep-water demersal finfish resources and fisheries off South Carolina. S.C. Mar. Resour. Cent. Tech. Rep. No. 57, 24 p.

Luckhurst, B. 1986. Discovery of deep-water crabs (Geryon spp.) at Bermuda – A new potential fishery resource. Proceedings of the Gulf and Caribbean Fisheries Institute, 37th Meeting. P. 209-211.

Lumsden S. E, T. F. Hourigan, A. W. Bruckner, G. Dorr (eds.). 2007. The State of Deep Coral Ecosystems of the United States. NOAA Technical Memorandum CRCP-3. Silver Spring, MD.

Lutz, P. L. and J. A. Musick (eds.). 1997. The Biology of Sea Turtles. CRC Press, Boca Raton, Florida.

Lutz, P. L., J. A. Musick, and J. Wyneken. 2002. The Biology of Sea Turtles, Volume II. CRC Press, Boca Raton, Florida.

Lux, F. E., A. R. Ganz, and W. F. Rathjen. 1982. Marking studies on the red crab, *Geryon quinquedens* Smith off southern New England. J. Shellfish Res. 2(1): 71-80.

Manning, R. B. and L. B. Holthuis. 1984. *Geryon fenneri*, a new deep-water crab from Florida (Crustacea: Decapoda: Geryonidae). Proceedings of the Biological Society of Washington 97:666-673.

Manning, R. B. and L. B. Holthuis. 1986. Notes on the *Geryon* from the Bahamas, with the description of *Geryon inghami*, a new species (Crustacea: Decapoda: Geryonidae). Proceedings of the Biological Society of Washington 99: 366-373.

Márquez -M, R. 1994. Synopsis of biological data on the Kemp's ridley turtles, *Lepidochelys kempii* (Garman, 1880). NOAA Technical Memorandum, NMFS-SEFSC-343. Miami, FL.

Masson, D. G., B. J. Bett, and D. S. M. Billet. 2003. The origin of deep-water, coral topped mounds in the northern Rockall Trough, Northeast Atlantic. Marine Geology 194:159-180.

McCosker, J. E. and S. W. Ross. In press. A new deepwater species of the snake eel genus *Ophichthus* (Anguilliformes: Ophicthidae), from North Carolina. Copeia.

McGoodwin, J. R. 1990. Crisis in the World's Fisheries, Stanford: Stanford University Press.

Mendonca, M. T. and P. C. H. Pritchard. 1986. Offshore movements of post-nesting Kemp's ridley sea turtles (*Lepidochelys kempi*). Herpetologica, 42:373.

Messing, C. G., A. C. Neuman, and J. C. Lang. 1990. Biozonations of deep-water lithoherms and associated hardgrounds in the northeastern Straits of Florida. Palaios 5:15-33.

Meylan, A. 1984. Feeding Ecology of the Hawksbill turtle (*Eretmochelys imbricata*): Spongivory as a Feeding Niche in the Coral Reef Community. Ph.D., University of Florida, Gainesville, FL.

Meylan, A. 1988. Spongivory in hawksbill turtles: a diet of glass. Science 239:393-395.

Meylan, A. B. and M. Donnelly. 1999. Status justification for listing the hawksbill turtle (*Eretmochelys imbricata*) as critically endangered on the 1996 IUCN Red List of Threatened Animals. Chelonian Conservation and Biology 3(2): 200-204.

Milliman, J. D. 1972. Atlantic Continental Shelf and Slope of the United States- Petrology of the sand fraction of sediments, northern New Jersey to southern Florida. U.S.G.S. Prof. Pap. 529-J. 40 pp.

Morgan, L. E. and R. Chuenpagdee. 2003. Shifting gears: addressing the collateral impacts of fishing methods in U.S. waters. Island Press, Washington. 42 p.

Mortensen, P. B. 2000. *Lophelia pertusa* in Norwegian waters: distribution, growth and associated fauna. Ph.D. Dissertation, University of Bergen, Department of Fisheries and Marine Biology.

_____, L. Buhl-Mortensen, D.C. Gordon Jr., G. B. J. Fader, D. L. McKeown and D. G. Fenton. 2005. Effects of fisheries on deepwater gorgonian corals in the Northeast Channel, Nova Scotia. *In* Barnes, P. W. and J. P. Thomas (eds.). Benthic habitats and the effects of fishing. American Fisheries Society Symposium 41. Bethesda, MD.

_____, and J. H. Fosså. 2006. Species diversity and spatial distribution of invertebrates on *Lophelia* reefs in Norway. Pages 1849-1868 *In:* Proceedings of the 10th International Coral Reef Symposium, Okinawa, Japan.

_____, and H. T. Rapp. 1998. Oxygen and carbon isotope ratios related to growth line patterns in skeletons of *Lophelia pertusa* (L) (Anthozoa, Scleractinia): implications for determination of linear extension rates. Sarsia 83: 433-446.

Mortimer, J. A. 1981. The feeding ecology of the West Caribbean green turtle (*Chelonia mydas*) in Nicaragua. Biotropica 13:49.

Mortimer, J. A. 1982. Feeding ecology of sea turtles. *In*: Bjorndal, K. A. (ed.). Biology and Conservation of Sea Turtles. Smithsonian Institute Press, Washington, D.C.

Myers, R. A. and G. Mertz. 1998. Reducing uncertainty in the biological basis of fisheries management by meta-analysis of data from many populations: A synthesis. Fish. Res. 37: 51-60.

NOAA Fisheries Service. 2000. Smalltooth Sawfish Status Review. NOAA National Marine Fisheries Service, Southeast Regional Office. St. Petersburg, FL. 73 p.

NOAA Fisheries Service. 2001. Stock assessments of loggerhead and leatherback sea turtles and an assessment of the impact of the pelagic longline fishery on the loggerhead and leatherback sea turtles of the Western North Atlantic. U.S. Department of Commerce, National Marine Fisheries Service, Miami, FL SEFSC Contribution PRD-00/01-08, Parts I-III and Appendices I-VI.

NOAA Fisheries Service. 2004. Final programmatic supplemental groundfish environmental impact statement for Alaska groundfish fisheries. U.S. Department of Commerce, NOAA, NMFS, Alaska Region, Juneau.

NOAA (National Oceanic and Atmospheric Administration). 2004a. Historical Highlights, 1950s. Available at: http://www.nefs.noaa.gov/history/timeline/1950.html

NOAA (National Oceanic and Atmospheric Administration). 2004b. Historical Highlights, 1960s. Avaialble at http://nefs.noaa.gov/history/timeline/1960.html

NOAA (National Oceanic and Atmospheric Administration). 2004c. Baird's Legacy; Progress and Change 1947-1971. Avaialble at http://www.nefsc.noaa.gov/history/stories/legacy/1947-71.html

Nance, J. M. (Editor). 1998. Report to Congress. Southeastern United States Shrimp Trawl Bycatch Program. NOAA National Marine Fisheries Service, Southeast Fisheries Science Center Galveston Laboratory, 154 p.

NRC (National Research Council). 2002. Effects of Trawling and Dredging on Seafloor Habitat: Phase 1. National Research Council, National Research Council Committee on Ecosystem Effects of Fishing. National Academies Press, Washington, DC.

National Shrimp Festival. 2004. Shrimp Info. Available at: http://www.gulf-shores-shrimp-festival.com/shrimp-info-recipies.html

Norman, J. R. and F. C. Fraser. 1938. Giant Fishes, Whales and Dolphins. W.W. Norton and Company, Inc, New York, NY. 361 pp.

NPFMC (North Pacific Fishery Management Council). 2003. Stock assessment and fishery evaluation report for the groundfish resources of the Bering Sea/ Aleutian Islands region. North Pacific Fishery Management Council, Anchorage, AK.

Ogren, L. H. 1989. Distribution of juvenile and subadult Kemp's ridley turtles: Preliminary results from the 1984-1987 surveys. *In*: C.W. Caillouet, Jr. and A. M. Landry, Jr. (eds.) Proceedings from the 1st Symposium on Kemp's ridley Sea Turtle Biology, Conservation, and Management. Sea Grant College Program, Galveston, TX. 116p.

Otwell, W. S., J. Bellairs, and D. Sweat. 1984. Initial development of a deep sea crab fishery in the Gulf of Mexico. Fla. Sea Grant Coll. Rep. No. 61, 29p.

Paredes, R. P. 1969. Introduccion al Estudio Biologico de *Chelonia mydas agassizi* en el Perfil de Pisco. M.S. Thesis, Universidad Nacional Federico Villareal, Lima, Peru.

Paull, C. K., A. C. Neumann, B. A. am Ende, W. Ussler, III, and N. M. Rodriguez. 2000. Lithoherms on the Florida-Hatteras slope. Marine Geology 166: 83-101. Abstract.

Perez-Farfante, I. 1977. American solenocerid shrimps of the genera *Hymenopenaeus*, *Halioporides*, *Pleoticus*, *Hadropenaeus* new genus, and *Mesopenaeus* new genus. U.S. Fish. Bull. 75:261-346.

Perry, H. and K. Larsen. 2004. Picture Guide to Shelf Invertebrates of the Northern Gulf of Mexico. NOAA/NMFS. Avaialble at: http://www.gsmfc.org/seamap/picture_guide/main.htm

Popenoe, P. and F. T. Manheim. 2001. Origin and history of the Charleston Bump-geological formations, currents, bottom conditions, and their relationship to wreckfish habitats on the Blake Plateau. Pages 43-93 *In:* G. R. Sedberry (ed.). Island in the Stream: oceanography and fisheries of the Charleston Bump. American Fisheries Society Symposium 25. American Fisheries Society, Bethesda, MD.

Porter, J. W. 1976. Autotrophy, heterotrophy, and resource partitioning in Caribbean reef corals. Amer Nat 110: 731-742.

Puglise, K. A., R. J. Brock, and J. J. McDonough. 2005. Identifying critical information needs and developing institutional partnerships to further the understanding of Atlantic deep-sea coral ecosystems. *In* Freiwald, A. and J. M. Roberts (eds). Cold-water corals and ecosystems. Springer-Verlag, Berlin.

Reed, J. K. 1983. Nearshore and shelf-edge *Oculina* coral reefs: the effects of upwelling on coral growth and on the associated faunal communities. NOAA Symposium Series Undersea research 1:119-124.

_____. 2002b. Comparison of deep-water coral reefs and lithoherms off southeastern U.S.A. Hydrobiologia 471: 57–69.

Reed, J. K., S. A. Pomponi, D. Weaver, C. K. Paull, and A. E. Wright. 2005a. Deep-water sinkholes and bioherms of south Florida and the Pourtales Terrace-habitat and fauna. Bulletin of Marine Science 77: 267-296.

Reed, J. K., A. Shepard, C. Koenig, K. Scanlon, and G. Gilmore. 2005b. Mapping, habitat characterization, and fish surveys of the deep-water *Oculina* coral reef Marine Protected Area: a review of historical and current research. Pages 443-465 *In:* Freiwald, A., and J. M. Roberts (eds.). Cold-water Corals and Ecosystems, Proceedings of Second International Symposium on Deep Sea Corals, Sept. 9-12, 2003, Erlangen, Germany, Springer-Verlag, Berlin Heidelberg.

Reed, J. K., D. C. Weaver, and S. A. Pomponi. 2006. Habitat and fauna of deep-water *Lophelia pertusa* coral reefs off the southeastern U.S.: Blake Plateau, Straits of Florida, and Gulf of Mexico. Bulletin of Marine Science 78: 343–375.

Rezak, R., T. J. Bright, and D. W. McGrail. 1985. Reefs and Banks of the Northwestern Gulf of Mexico. New York: John Wiley and Sons.

Richer de Forges, B., J. A. Koslow, and G. C. B. Poore. 2000. Diversity and endemism of the benthic seaount fauna in the southwest Pacific. Nature 405:944-947.

Risk, M. J., J. M. Heikoop, M. G. Snow, and R. Beukens. 2002. Lifespans and growth patterns of two deep-sea corals: *Primnoa resedaeformis* and *Desmophyllum cristagalli*. Hydrobiologia 471 (1-3): 125-131.

Rogers, A. D. 1999. The biology of *Lophelia pertusa* (Linnaeus 1758) and other deep-water reef-forming corals and impacts from human activities. International Review of Hydrobiology 84: 315-406.

Rogers, A. D. 2004. The biology, ecology and vulnerability of seaount communities. International Union for the Conservation of Nature and Natural Resources http:///www.iucn.org/themes/marine/pdf/AlexRogers-CBDCOP7-Seamounts-Complete.pdf

Ross, S. W. and M. S. Nizinski. 2007. State of the U.S. Deep Coral Ecosystems in the Southeastern United States Region: Cape Hatteras to the Florida Straits. NOAA Tech. Memo. NMFS-OPR-29. Silver Spring, MD.

Ross, S. W. and A. M. Quattrini. 2007. The Fish Fauna Associated with Deep Coral Banks off the Southeastern United States. Deep-sea Research I 54:975-1007.

Rothschild, B. J. 1986. Dynamics of marine fish populations. Harvard University Press, Cambridge, MA.

Rylaarsdam, K.W. 1983. Life histories and abundance patterns of colonial corals on Jamaican reefs. Mar Ecol Prog Ser 13: 249-260.

SAFMC (South Atlantic Fishery Management Council). 1988. Amendment 1 to the Snapper Grouper Fishery Management Plan. South Atlantic Fishery Management Council, 1 Southpark Cir., Suite 306, Charleston, S.C. 29407-4699.

SAFMC (South Atlantic Fishery Management Council). 1990. Amendment 1 to the Fishery Management Plan for Coral and Coral Reefs, (Including Environmental Assessment, Regulatory Impact Review, and Initial Regulatory Flexibility Analysis). Gulf of Mexico Fishery Management Council, 5401 West Kennedy Boulevard, Suite 881, Tampa, Florida. 18 pp.

SAFMC (South Atlantic Fishery Management Council). 1991a. Fishery Management Plan for the Shrimp Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Cir., Suite 306, Charleston, S.C. 29407-4699. 184 p + appendices.

SAFMC (South Atlantic Fishery Management Council). 1991b. Amendment 5 (Wreckfish) to the Snapper Grouper Fishery Management Plan. South Atlantic Fishery Management Council, 1 Southpark Cir., Suite 306, Charleston, S.C. 29407-4699.

SAFMC (South Atlantic Fishery Management Council). 1995. Fishery Management Plan for the Golden Crab Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Cir., Suite 306, Charleston, S.C. 29407. 239 pp.

SAFMC (South Atlantic Fishery Management Council). 1996a. Amendment 1 to the Fishery Management Plan for the Shrimp Fishery of the South Atlantic Region (Rock Shrimp). South Atlantic Fishery Management Council, 1 Southpark Cir., Suite 306, Charleston, S.C. 29407-4699. 118 p + appendices.

SAFMC (South Atlantic Fishery Management Council). 1996b. Amendment 2 (Bycatch Reduction) to the Fishery Management Plan for the Shrimp Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Cir., Suite 306, Charleston, S.C. 29407-4699. 108p + appendices.

SAFMC (South Atlantic Fishery Management Council). 1997. Framework Seasonal Adjustment #1. Fishery Management Plan for the Golden Crab Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Cir., Suite 306, Charleston, S.C. 29407-4699.

SAFMC (South Atlantic Fishery Management Council). 1998a. Habitat Plan for the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Cir., Ste 306, Charleston, S.C. 29407-4699

SAFMC (South Atlantic Fishery Management Council). 1998b. Comprehensive Amendment Addressing Essential Fish Habitat in Fishery Management Plans of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Cir., Suite 306, Charleston, S.C. 29407-4699.

SAFMC (South Atlantic Fishery Management Council). 1998c. Comprehensive Amendment Addressing Sustainable Fishery Act Definitions and Other Required Provisions in Fishery Management Plans of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Cir., Suite 306, Charleston, S.C. 29407-4699. 151 pp.

SAFMC (South Atlantic Fishery Management Council). 2000. Amendment 3 to the Fishery Management Plan for the Golden Crab Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Cir., Suite 306, Charleston, S.C. 29407-4699.

SAFMC (South Atlantic Fishery Management Council). 2002a. Amendment 5 to the Fishery Management Plan for the Shrimp Fishery of the South Atlantic Region (Rock Shrimp). South Atlantic Fishery Management Council, 1 Southpark Cir., Suite 306, Charleston, S.C. 29407-4699. 139 p + appendices.

SAFMC (South Atlantic Fishery Management Council). 2002b. Fishery Management Plan for Pelagic *Sargassum* Habitat. South Atlantic Fishery Management Council, 1 Southpark Cir., Suite 306, Charleston, S.C. 29407-4699. 228 p.

SAFMC (South Atlantic Fishery Management Council). 2003a. Fishery Management Plan for the Dolphin and Wahoo Fishery of the Atlantic. South Atlantic Fishery Management Council, 1 Southpark Cir., Suite 306, Charleston, S.C. 29407-4699.

SAFMC (South Atlantic Fishery Management Council). 2003b. Fishery Management Plan for the Dolphin and Wahoo Fishery of the Atlantic. South Atlantic Fishery Management Council, 1 Southpark Cir., Suite 306, Charleston, S.C. 29407-4699.

SAFMC (South Atlantic Fishery Management Council). 2005. Amendment 6 to the Fishery Management Plan for the Shrimp Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Cir., Suite 306, Charleston, S.C. 29407-4699. 256p + appendices.

SAFMC (South Atlantic Fishery Management Council). 2007. Amendment 14 to the Snapper Grouper Fishery Management Plan. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Suite 201; North Charleston, SC 29405.

SAFMC (South Atlantic Fishery Management Council). 2009. Snapper Grouper Amendment 16. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Suite 201, North Charleston, SC 29405.

SAFMC (South Atlantic Fishery Management Council). 2008. Amendment 7 to the Fishery Management Plan for the Shrimp Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, , 4055 Faber Place Drive, Suite 201, North Charleston, SC 29405. 186 pp.

SAFMC (South Atlantic Fishery Management Council). 2009a. Snapper Grouper Amendment 15B. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Suite 201, North Charleston, SC 29405.

SAFMC (South Atlantic Fishery Management Council). 2009b. Fishery Ecosystem Plan For the South Atlantic Region, Volumes I-V. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Suite 201, North Charleston, SC 29405. 3,000 pp.

SAFMC (South Atlantic Fishery Management Council). 2009c. Comprehensive Ecosystem-Based Amendment 1. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Suite 201, North Charleston, SC 29405.

SAFMC (South Atlantic Fishery Management Council). In prep. Snapper Grouper Amendment 17. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Suite 201, North Charleston, SC 29405.

SAFMC (South Atlantic Fishery Management Council). In prep. Comprehensive Annual Catch Limits (ACL) Amendment. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Suite 201, North Charleston, SC 29405.

Sammarco, P. W. 1980. *Diadema* and its relationship to coral spat mortality: grazing, competition, and biological disturbance. Journal of Experimental Marine Biology and Ecology 45:245-272.

Sanchirico, J. N., K. A. Cochran, and P. M. Emerson. 2002. Marine protected areas: economic and social implications. Resources for the Future, Discussion Paper 02-26, Washington, D.C.

Scelzo, M. A. and E. E. Boschi. 1975. Cultivo del langostino *Hymenopenaeus muelleri* (Crustacea, Decapoda, Penaeidae). Physis, Secc. A, 34: 193-197.

Schroeder, W. C. 1959. The lobster *Homarus americanus*, and the red crab, *Geryon quinquedenes*, in the offshore waters of the western North Atlantic. Deep-Sea Research 5: 266-279.

Schwartz, F. J. 2003. Bilateral asymmetry in the rostrum of the smalltooth sawfish, *Pristis pectinata* (pristiformes: family pristidae). Journal of North Carolina Academy of Science, 119:41-47.

Sea Grant Louisiana. 2006. Rock Shrimp. Lagniappe Vol.30, No.9

Shaver, D. J. 1991. Feeding ecology of wild and head-started Kemp's ridley sea turtles in south Texas waters. Journal of Herpetology, 25:327.

Sherwood, O. A., D. B. Scott, M. J. Risk, and T. P. Guilderson. 2005. Radiocarbon evidence for annual growth rings in the deep-sea octocoral *Primnoa resedaeformis*. Marine Ecology Progress Series 301: 129-134.

Shrimp Lady (Accessed 2007). Available at: http://www.shrimplady.com/default.htm

Simpfendorfer, C. A. 2001. Essential habitat of the smalltooth sawfish, *Pristis pectinata*. Report to the National Fisheries Service's Protected Resources Division. Mote Marine Laboratory Technical Report (786) 21pp.

Simpfendorfer, C. A. and T. R. Wiley. 2004. Determination of the distribution of Florida's remnant sawfish population, and identification of areas critical to their conservation. Mote Marine Laboratory Technical Report, July 2, 2004 37 pp.

Soma, M. 1985. Radio biotelemetry system applied to migratory study of turtle. Journal of the Faculty of Marine Science and Technology, Tokai University, Japan, 21:47.

Soong, K. and J. C. Lang. 1992. Reproductive integration in coral reefs. Biol. Bull. 183: 418-431.

Squires, D. F. 1959. Deep sea corals collected by the Lamont Geological Observatory. I. Atlantic corals. American Museum Novitates No. 1965:1-42.

Standora, E. A., J. R. Spotila, J. A. Keinath, and C. R. Shoop. 1984. Body temperatures, diving cycles, and movements of a subadult leatherback turtle, *Dermochelys coriacea*. Herpetologica, 40:169.

Stiles, M. L., E. Harrould-Kolieb, P. Faure, H. Ylitalo-Ward and M. F. Hirshfield. 2007. Deep Sea Trawl Fisheries of the Southeast US and Gulf of Mexico: Rock shrimp, Royal red shrimp, Calico scallops. Oceana. Washington, DC.

Szmant, A. M. and M. Miller. 2006. Settlement preferences and post-settlement mortality of laboratory cultured and settled larvae of the Caribbean hermatypic corals *Montastraea faveolata* and *Acropora palmata* in the Florida Keys, USA. Proceedings of the 10th International Coral Reef Symposium.

Thayer, G. W., K. A. Bjorndal, J. C. Ogden, S. L. Williams, and J. C. Zieman. 1984. Role of large herbivores in seagrass communities. Estuaries, 7:351.

Van Dam, R. and C. Diéz. 1998. Home range of immature hawksbill turtles (*Eretmochelys imbricata*) at two Caribbean islands. Journal of Experimental Marine Biology and Ecology 220(1):15-24.

Van Dover, C.L., P. Aharonb, J. M. Bernhardc, E. Caylord, M. Doerriesa, W. Flickingera, W. Gilhoolyd, S. K. Goffredie, K. E. Knicka, S. A. Mackod, S. Rapoporta, E. C. Raulfsa, C. Ruppelf, J. L. Salernoa, R. D. Seitzg, B. K. Sen Guptah, T. Shanki, M. Turnipseeda and R. Vrijenhoeke. 2003. Blake Ridge methane seeps: characterization of a soft-sediment, chemosynthetically based ecosystem. Deep Sea Research Part I : Oceanographic Research Papers 50(2) :281-300.

Walker, T. A. 1994. Post-hatchling dispersal of sea turtles. p. 79. *In*: Proceedings of the Australian Marine Turtle Conservation Workshop, Queensland Australia.

Waring, G. T., D. L. Palka, P. J. Clapham, S. Swartz, M. Rossman, T. Cole, K. D. Bisack, and L. J. Hansen. 1998. U.S. Atlantic Marine Mammal Stock Assessments. NOAA NOAA Technical Memorandum NMFS-NEFSC. Northeast Fisheries Science Center, Woods Hole, Massachusetts 02543-1026. December.

Waring, G. T., J. M. Quintal, and C. P. Fairfield (eds). 2002. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments - 2002. NOAA Technical Memorandum NMFS-NE-169. Northeast Fisheries Science Center, Woods Hole, Massachusetts 02543-1026. September.

Weaver, D. C. and G. R. Sedberry. 2001. Trophic subsidies at the Charleston Bump: food web structure of reef fishes on the continental slope of the southeastern United States. P. 137-152 *In:* Sedberry, G.R. (ed.). Island in the Stream: oceanography and fisheries of the Charleston Bump. American Fisheries Society Symposium 25. American Fisheries Society, Bethesda, MD.

Wenner, E. L., G. F. Ulrich, and J. B. Wise. 1987. Exploration for the golden crab, *Geryon fenneri*, in the south Atlantic Bight: distribution, population structure, and gear assessment. Fishery Bulletin 85: 547-560.

Wenner, E. L. and C. A. Barans. 1990. *In situ* estimates of golden crab, *Chaceon fenneri*, from habitats on the continental slope, southeast U.S. Bulletin of Marine Science 46(3): 723-734.

Wenner, E. L. and C. A. Barans. 2001. Benthic habitats and associated fauna of the upper- and middle-continental slope near the Charleston Bump. Pages 161-178 *In:* Sedbery, G. R. (ed.). Island in the Stream: oceanography and fisheries of the Charleston Bump. American Fisheries Society Symposium 25. Bethesda, MD.

Whitaker, D. L. 1982. Notes on biology of the rock shrimp off South Carolina. Presented at the joint Southeastern Estuarine Research Society/Gulf Estuarine Research Society meeting, Nov. 12, 1982. 14 p.

White, D. B., D. M. Wyanski, and G. R. Sedberry. 1998. Age, growth, and reproductive biology of the blackbelly rosefish from the Carolinas, USA. J. Fish Biol. 53(6):1274-1291.

Wigley, R. L., R. B. Theroux, and H. E. Murray. 1975. Deep sea red crab, *Geryon quinquedens*, survey off northeastern United States. Mar. Fish. Rev. 37(8):1-27.

Williams, E. H. and L. Bunkley-Williams. 1990. The world-wide coral reef bleaching cycle and related sources of coral mortality. Atoll Research Bulletin 335: 1-71.

Williams, B., M. J. Risk, S. W. Ross, and K. J. Sulak. 2006. Deep-water Antipatharians: proxies of environmental change. Geology 34(9): 773-776.

Williams, B., M. J. Risk, S. W. Ross, K. J. Sulak. In press. Stable isotope records from deep-water antipatharians: 400-year records from the south-eastern coast of the United States of America. Bulletin of Marine Science.

Wilson, J. B. 1979. "Patch" development of the deep-water coral *Lophelia pertusa* (L.) on Rockall Bank. Journal of the Marine Biological Association of the United Kingdom 59:165-177.

Witzell, W. N. 2002. Immature Atlantic loggerhead turtles (*Caretta caretta*): suggested changes to the life history model. Herpetological Review 33(4):266-269.

WWF (World Wildlife Fund). 2006. Policy proposals and operational guidance for ecosystem-based management of marine capture fisheries. WWF International, Gland, Switzerland, 80pp.

12 Index

Appendix A. Alternatives Considered but Eliminated from Analysis

Appendix B. Golden Crab AP Catch Shares Report

Golden Crab AP Catch Shares Report

August 25, 2009
Charleston, SC

Attendees:
David Cupka (Council Member and Golden Crab Committee Chair)
Bill Whipple (AP member)
Howard Rau (AP member)
Randy Manchester (AP member)
Glenn Ulrich (AP member)
Nuno Almeida (Golden Crab Fisherman)
Kate Quigley (SAFMC staff)
Gregg Waugh (SAFMC staff)

WORKING DOCUMENT

Program Goals:

- Enable the crab fishery to fulfill its potential to deliver high quality live crab anywhere in the world.

Program Objectives:

1. Develop catch share management that provides flexibility such that boat repairs and illness do not interrupt the ability of fishermen to make a living.
2. Allow for permit stacking on one vessel to maximize efficiency and enable fishing more than one zone in a trip.
3. Allow fishermen the ability to sell portions of their harvest privileges via catch shares.
4. Allow for increased stewardship opportunities for fishermen to protect corals by allowing for ownership of catch share privileges.
5. Provide protection for historical participation and traditional fishing grounds by implementing a catch share program that relies on catch history for initial allocation and prevents fishermen exceeding the ACL.

Eligibility for Initial Allocation

Option 1: Any person holding a current permit as of implementation date (yet unspecified) in any zone is eligible for initial allocation. Eligibility is based on vessel logbook data and varies based on initial allocation formula. Catch history is based on currently permitted vessels as of September 2009.

Vessel Catch History Initial Allocation

The following possible initial allocation formulas were developed and analyzed:

Option 1: 2002-2008 aggregate catch history by vessel

Option 2: 1995-2008 aggregate catch history by vessel

Option 3: 1998-2008 aggregate catch history by vessel. Vessels with below 5% initial allocation receive an extra 2% per vessel excluding those receiving greater than 30% initial allocation on vessels combined. Extra 2% comes out of highest share holder. Must have 25,000 pounds aggregate to receive bonus.

Option 4: 1998-2008 catch history by vessel **and** must have catch history since 1998. Vessels below 5% initial allocation receive an extra 5% per vessel excluding those receiving greater than 30% initial allocation on vessels combined. Extra 5% comes out of highest share holder. Must have 25,000 pounds aggregate to receive bonus.

Option 5: 2006-2008 catch history by vessel. Vessels fishing between 2007 and 2009 that get less than 10% initial allocation receive an additional 7% per vessel excluding those that receive greater than 20% initial allocation on vessels combined. Extra 7% comes out of highest share holder. Must have 50,000 pounds aggregate to receive bonus.

Option 6: 2006-2008 catch history by vessel. If vessels fished in the last 5 years and received less than 20% initial allocation, each vessel owner receives an additional 5% excluding those that receive greater than 20% initial allocation on vessels combined. Extra 5% comes out of highest share holder. Must have 50,000 pounds aggregate to receive bonus.

Option 7: 50% catch history + 50% equal allocation

Sub-option 1: 1995-2008
1a: Must have 25,000 pounds aggregate to receive equal allocation portion.
1c: Must have 50,000 pounds aggregate to receive allocation portion.

Sub-option 2: 2005-2008
1a: Must have 25,000 pounds aggregate to receive allocation portion.
1b: Must have 50,000 pounds aggregate to receive allocation portion.

Sub-option 3: 2002-2008, 50,000, 25,000
1a: Must have 25,000 pounds aggregate to receive allocation portion.
1b: Must have 50,000 pounds aggregate to receive allocation portion.

Option 8: 75% catch history + 25% equal allocation

Sub-option 1: 1995-2008
1a: Must have 25,000 pounds aggregate to receive allocation portion.
1b: Must have 50,000 pounds aggregate to receive allocation portion.

Sub-option 2: 2005-2008
1a: Must have 25,000 pounds aggregate to receive allocation portion.
1b: Must have 50,000 pounds aggregate to receive allocation portion.

Sub-option 3: 2002-2008, 50,000, 25,000
1a: Must have 25,000 pounds aggregate to receive allocation portion.

1b: Must have 50,000 pounds aggregate to receive allocation portion.

Option 9: Equal allocation of the ACL

Sub-option 1: 11 vessel owners
Sub-option 2: 4 active vessels

Option 10: Best 3 years averaged

Sub-option 1: 1995-2008
1a: Must have 25,000 pounds aggregate to receive allocation portion.
1b: Must have 50,000 pounds aggregate to receive allocation portion.
Sub-option 2: 2005-2008
1a: Must have 25,000 pounds aggregate to receive allocation portion.
1b: Must have 50,000 pounds aggregate to receive allocation portion.
Sub-option 3: 2002-2008, 50,000, 25,000
1a: Must have 25,000 pounds aggregate to receive allocation portion.
1b: Must have 50,000 pounds aggregate to receive allocation portion.

*Disadvantages of using vessel catch history – individuals that own two active permits and one vessel, would suffer under vessel catch history allocation.

*Disadvantages of using permit catch history – some individuals lease permits but use their own vessel. Using permit catch history, they would not be included in the initial allocation

*Disadvantages of no allocation for latent permits – Individuals with inactive permits receive nothing for their permit even though they made an investment in the fishery

*Advantages of no allocation for latent permits – Active vessels receive more than if latent permits are included, which would enable active participants to continue fishing if the ACL is low.

Permit Catch History Initial Allocation

*Permit catch history data has been requested and will be available by December.

Eligibility for Harvest

Preferred Option 1: Any person holding a current (as in paid fees) permit in any zone is eligible to participate in the golden crab catch share program. New entrants to the fishery must purchase annual pounds and purchase or lease a permit. There are 11 permits in the fishery and to obtain a permit, someone would have to purchase or lease one of the 11 permits.

Appeals Process

Preferred Option 1: 1-2% of ACL will be set aside for the appeals process. If set aside is not used, it will be returned back to the overall quota pool and will be redistributed based on the original initial allocation to all share holders. The NMFS Regional Administrator would

administer the appeals process. The process will be conducted 90 days after initial allocation and before the bonus is distributed. There will be no hardship clause and the appeals process will rely upon trip tickets to establish additional landings.

Program Duration

Preferred Option 1: The program will exist in perpetuity unless modified by the SAFMC.

Program review

Preferred Option 1: Perform review every 5-7 years. The program reviews would coincide (one year post) with stock assessments, if possible, so that changes to the program in response to the stock assessment can occur.

Transferability

Preferred Option 1: Program allows for all or a portion of permanent (quota share) and temporary (annual pounds) sale of quota among all permit holders and those leasing a permit.

Quota Share Ownership Caps

Option 1. Cap on ownership of quota share where the maximum percentage (quota share) initially allocated would serve as the ownership cap.
Option 2. 55%
Option 3. 65%
Option 4. 75%
Option 5. Cap on ownership of quota share that is lower than the amount initially allocated to the highest quota share holder

Sub-option A. 55%
Sub-option B. 65%
Sub-option C. 75%

Use It or Lose It

Preferred Option 1: Permit owner or person leasing a permit must have used at least 10% of an individual's quota share for one year (fished, quota share sale, or sale of annual lbs) on a cumulative basis during a two year period using a running average.

Cost Recovery

As defined by the MSA

*NMFS cost estimates requested.

Boat Length Limit

Option 1: Leave boat length limit rule.
Preferred Option 2: Eliminate boat length limit rule in the middle and southern zones.

Rationale: Greater length is sometimes needed after implementation of the RSW system. A larger boat is more efficient. However, the vessel length is somewhat limited by the catch shares and the quota share ownership cap.

Zone Issues

Preferred Option 1: Participants can use quota in any zone for which they possess a permit.
Preferred Option 2: Eliminate box in southern zone originally established to protect against very large vessels.

Note: not mutually exclusive. The GC AP has an interest in both occurring.

Rationale: Eliminating the box would allow vessels over 65 feet to participate in that area. Very little fishing has occurred in the Southern Zone, perhaps because of the box, for some time and it is seen as no longer necessary in that the problem that created this solution (implementation of the box) no longer exists. If you are smaller than 65 feet and have a permit in the Southern Zone, you are restricted to fishing in the box and cannot fish outside the box.

Permit Stacking

Preferred Option 1: Allow for stacking of up to three permits on one vessel so that any zones for which the vessel has a permit can be fished in one trip.

Monitoring

Option 1: Phase in additional monitoring as necessary based on the economic capacity of the fishery. Explore real-time reporting via electronic monitoring (recording trip ticket and logbook data on a website upon landing).

Note: There may be a discrepancy between logbook landings and trip ticket if, during shipping, there is shrinkage (5-10%) and any such comparison between logbooks and trip tickets would need to account for this.

Enforcement

Option 1: Consider requiring hail in (at least 3 hrs ahead of time whereby a message could be left or texted in excess of 3 hours) when landing with location and time or other information deemed necessary by enforcement. The specific hours of landing and departing are difficult to identify due to weather, tides, and nature of the Gulf Stream. Because the crabs are brought in live, time is of the essence. In order to maintain a quality product, landings need to occur immediately upon arrival at the dock. Also, renewing re-circulating seawater is not always an option near shore where water is murky and of low salinity. Therefore, landings need to occur at any time during 24 hrs. Work with law enforcement to determine specifics.

New Entrants

Option 1: Set aside some amount of annual pounds for new entrants when quota is:

- released as a part of a violation
- lost quota (use it or lose it provision); and
- when the ACL exceeds 3 million pounds

Note: Look into what new entrant programs have been implemented in other catch shares programs.

Banking and Borrowing

Preferred Option 1: 20,000 lbs borrowing allowance each year (Check with Monica – Is there a problem with this given ACLs and AMs?)
Preferred Option 2: 20,000 lbs banking allowance each year