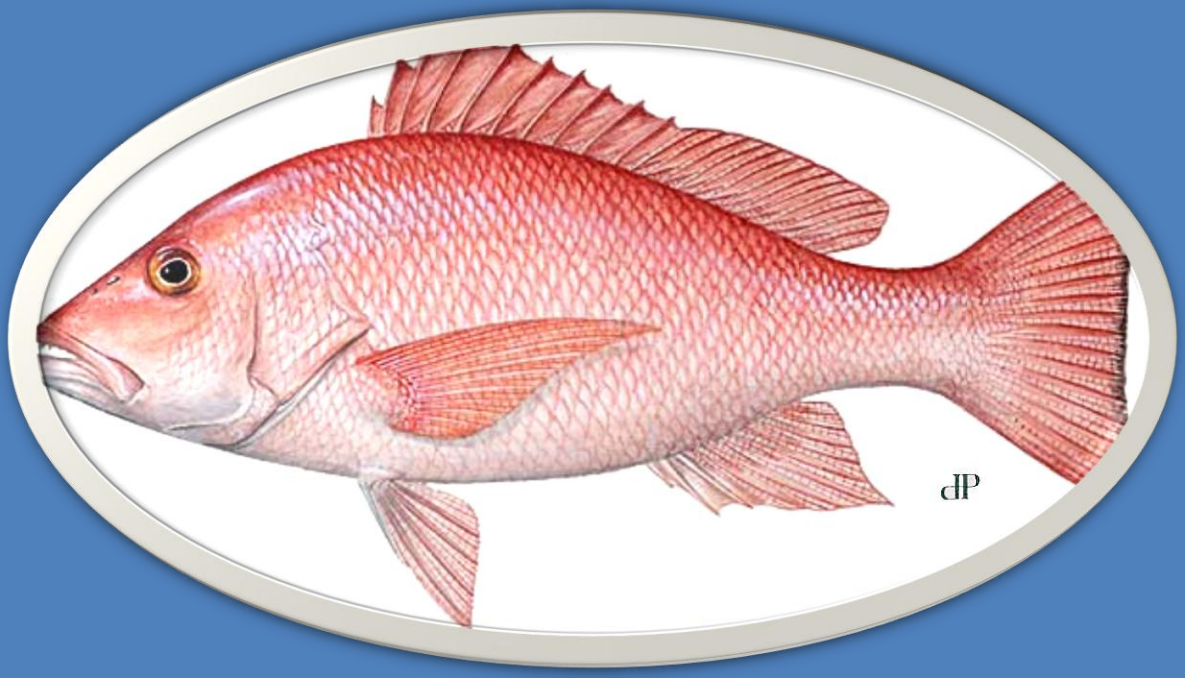

Measures to Allow Limited Harvest of Red Snapper (*Lutjanus campechanus*) in the South Atlantic in 2012

Temporary Measures through Emergency Action

Environmental Assessment **Regulatory Impact Review** **Fishery Impact Statement**

August 2012

Definitions, Abbreviations, and Acronyms Used in the Document

ABC	acceptable biological catch
ACL	annual catch limits
AM	accountability measures
ACT	annual catch target
B	a measure of stock biomass in either weight or other appropriate unit
$\mathbf{B_{MSY}}$	the stock biomass expected to exist under equilibrium conditions when fishing at F_{MSY}
$\mathbf{B_{OY}}$	the stock biomass expected to exist under equilibrium conditions when fishing at F_{OY}
$\mathbf{B_{CURR}}$	the current stock biomass
CPUE	catch per unit effort
DEIS	draft environmental impact statement
EA	environmental assessment
EEZ	exclusive economic zone
EFH	essential fish habitat
F	a measure of the instantaneous rate of fishing mortality
$\mathbf{F_{30\%SPR}}$	fishing mortality that will produce a static SPR = 30%
$\mathbf{F_{CURR}}$	the current instantaneous rate of fishing mortality
$\mathbf{F_{MSY}}$	the rate of fishing mortality expected to achieve MSY under equilibrium conditions and a corresponding biomass of B_{MSY}
$\mathbf{F_{OY}}$	the rate of fishing mortality expected to achieve OY under equilibrium conditions and a corresponding biomass of B_{OY}
FEIS	final environmental impact statement
FMP	fishery management plan
FMU	fishery management unit
M	natural mortality rate
MARMAP	Marine Resources Monitoring Assessment and Prediction Program
MFMT	maximum fishing mortality threshold
MMPA	Marine Mammal Protection Act
MRFSS	Marine Recreational Fisheries Statistics Survey
MRIP	Marine Recreational Information Program
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MSST	minimum stock size threshold
MSY	maximum sustainable yield
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OFL	overfishing limit
OY	optimum yield
RIR	regulatory impact review
SAMFC	South Atlantic Fishery Management Council
SEDAR	Southeast Data, Assessment, and Review
SEFSC	Southeast Fisheries Science Center
SERO	Southeast Regional Office
SIA	social impact assessment
SPR	spawning potential ratio
SSC	Scientific and Statistical Committee

2012 Temporary Measures through Emergency Action for Red Snapper in the South Atlantic

Documents:	Environmental assessment Regulatory impact review Fishery impact statement
Proposed actions:	To allow a limited harvest of red snapper in 2012
Lead agency:	NOAA Fisheries
For Further Information Contact:	Phil Steele NOAA Fisheries, Southeast Region 263 13th Avenue South St. Petersburg, FL 33701 727-824-5301 Phil.Steele@noaa.gov

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Chapter 1.
Introduction

1.1 What Actions Are Being Proposed?

The harvest and possession of red snapper has been prohibited since January 4, 2010. Fishery managers are proposing temporary changes to the red snapper regulations, for 2012 by means of a temporary rule through emergency action under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). Managers are proposing several actions; the most noteworthy would allow some harvest of red snapper for a limited time in 2012.

1.2 Who is Proposing the Actions?

The South Atlantic Fishery Management Council (South Atlantic Council) evaluated new information regarding red snapper at their June 2012 meeting and requested emergency action in a June 19, 2012, letter (**Appendix G**) addressed to NOAA Fisheries Service (NOAA Fisheries). NOAA Fisheries Service is an agency within the National Oceanic and Atmospheric Administration and the Department of Commerce. Under the the Magnuson-Stevens Act, the Secretary of Commerce may promulgate emergency regulations if the South Atlantic Council requests the taking of such action by less than unanimous vote. The South Atlantic Council voted 12 to 1 to request emergency action at their June 2012 meeting.

South Atlantic Fishery Management Council

- Responsible for conservation and management of fish stocks
- Consists of 13 voting members: 8 appointed by the Secretary of Commerce, 1 representative from each of the 4 South Atlantic states, the Southeast Regional Director of NOAA Fisheries Service; and 4 non-voting members
- Responsible for developing fishery management plans and amendments under the Magnuson-Stevens Act; and recommends actions to NOAA Fisheries Service for implementation
- Management area is from 3 to 200 miles off the coasts of North Carolina, South Carolina, Georgia, and east Florida through Key West with the exception of Mackerel which is from New York to Florida, and Dolphin-Wahoo, which is from Maine to Florida

1.3 Where is the Project Located?

Management of the federal snapper grouper fishery located off the southeastern United States (South Atlantic) in the 3-200 nautical miles U.S. Exclusive Economic Zone is conducted under the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP, SAFMC 1983) (**Figure 1-1**). Red snapper is one of sixty fish managed by the South Atlantic Council under the Snapper Grouper FMP.

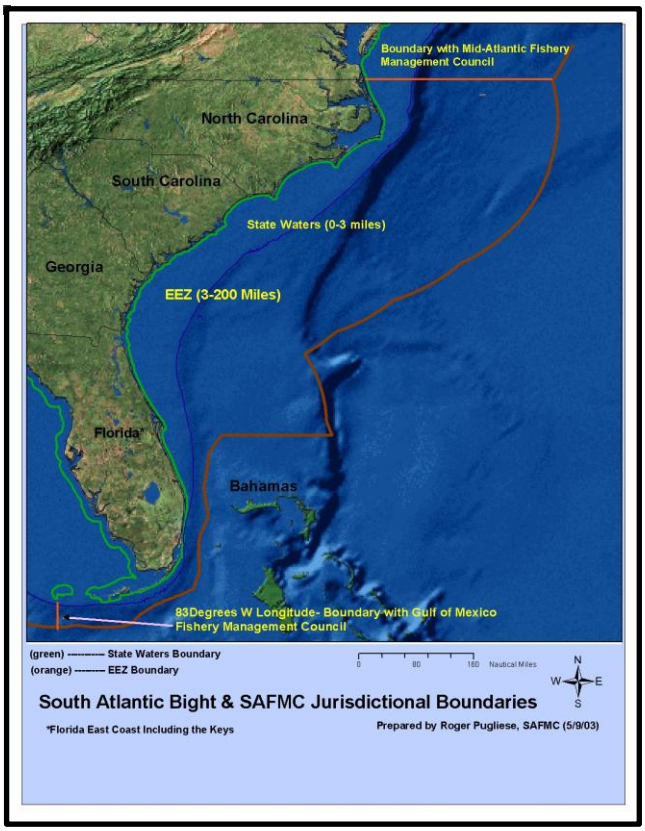


Figure 1-1. Jurisdictional boundaries of the South Atlantic Fishery Management Council.

1.4 Why is the Council and NOAA Fisheries Considering Action?

The South Atlantic Council and NOAA Fisheries have determined that retention of a limited number of red snapper in 2012, along with appropriate management controls, would not jeopardize the rebuilding of the red snapper stock. The South Atlantic Council and NOAA Fisheries made this determination following a comparison of the allowable mortality for red snapper in 2012 under the red snapper rebuilding plan with recent discards levels. The method is described in more detail in **Section 1.6** and **Appendix C**. The preferred alternatives evaluated in this environmental assessment as outlined in **Chapter 2** were contained in the South Atlantic Council's request (**Appendix G**).

Purpose for Action

Establish regulations to allow some harvest of red snapper in the South Atlantic in 2012.

Need for Action

Reduce existing socio-economic adverse impacts to fishermen and fishing communities that utilize the red snapper portion of the snapper grouper fishery. Regulations should minimize (1) safety at sea concerns, (2) probability of overages of the annual catch limit, and (3) discard mortality of red snapper. In addition, collect fishery-dependent information on the life history of red snapper.

1.5 Are These Actions Within the Bounds of the Scientific Recommendations?

The proposed actions for red snapper are consistent with the following: (1) Assessment results from Southeast Data, Assessment, and Review (SEDAR) 24; (2) rebuilding projections provided by the Southeast Fisheries Science Center (SEFSC); (3) acceptable biological catch (ABC) recommendation from the South Atlantic Council's Scientific and Statistical Committee (SSC); and (4) rebuilding plan implemented in 2010. The assessment and the rebuilding plan have been peer reviewed and are based on the best available scientific information.

The South Atlantic Council determines the annual catch limits (ACLs) from the overfishing limit (OFL) and the ABC (**Figure 1-2**). The SSC determines the OFL and recommends the ABC (based on the South Atlantic Council/SSC's ABC control rule). The OFL is an estimate of the catch level above which overfishing is occurring and may come from a stock assessment. The ABC is defined as the level of a stock or stock complex's annual catch that accounts for the scientific uncertainty in the estimate of OFL and any other scientific uncertainty, and should be specified based on the South Atlantic Council/SSC's ABC control rule. Using the ABC as a start, the South Atlantic Council is proposing to increase the total ACL for the red snapper stock in the South Atlantic for 2012 from the current ACL of zero (landings only). The total ACL is then divided into sector ACLs using the commercial and recreational allocations for red snapper of 28.07% and 71.93%, respectively; the South Atlantic Council specified the allocations through the Comprehensive ACL Amendment (SAFMC 2011b).

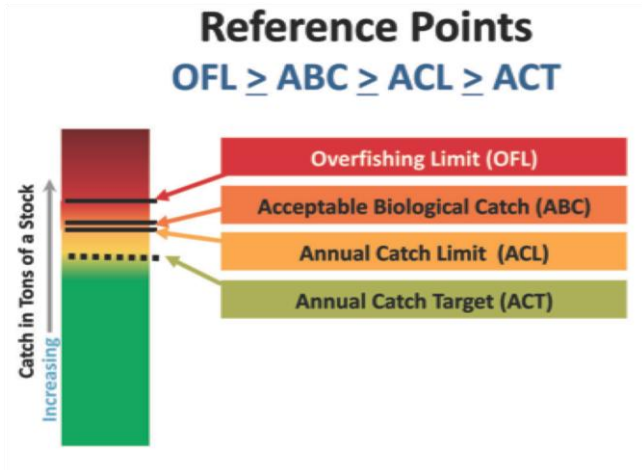


Figure 1-2. The relationship of the reference points to each other.

The ABC recommendation for red snapper from the South Atlantic Council's SSC is the catch level that corresponds to the rebuilding projections based on the rebuilding goal identified by the South Atlantic Council. The rebuilding projections were provided by the SEFSC and are included in **Appendix I-A** of Regulatory Amendment 10 to the Snapper Grouper FMP. The rebuilding goal is based on achieving a rate of fishing mortality equal to 98%$F_{30\%SPR}$, which equates to an ABC range of 374,000 to 421,000 lbs whole weight (ww) in 2011. ABCs of 374,000, 395,000, and 421,000 lbs ww from three rebuilding projections correspond to a headboat index weight of 0.20, 0.25, and 0.30, respectively. Increasing the weight in the headboat index (ie, 0.30 versus 0.20) implies greater confidence in the observed catch-per-unit-effort value. The South Atlantic Council adopted the ABC corresponding to the headboat index of 0.30, which equates to an ABC of 421,000 lbs ww for 2011, and an ABC of 541,000 lbs ww (86,000 fish) for 2012. The headboat index is considered a highly reliable source of information on stock abundance, and

the inability of the base run used in SEDAR 24 to match a pronounced increase in headboat CPUE was considered a key point in the assessment.

1.6 How Were the ACL Alternatives Determined?

Fishery managers are proposing an increase in the red snapper ACL for 2012. Chapter 2 of this document lists the ACL alternatives. The current ACL is zero (landings only) for red snapper, and the ABC for 2012 based on the rebuilding projection with a headboat index weight of 0.30 is 86,000 fish. In other words, 86,000 fish may be killed in 2012 under the rebuilding plan; kill is from landings or discard mortality. This ABC represents the amount of red snapper that can die in 2012 and not affect the rebuilding of the red snapper stock. Fishery managers are proposing a temporary increase of the ACL for 2012. To determine the 2012 ACL, fishery managers compared the estimated 2012 level of dead discards to the ABC for 2012. The 2010/2011 dead discard estimates and methods used to estimate 2012 dead discards are described in **Appendices B** and **C**, respectively. The ACL for 2012 is the difference between the ABC (projected mortalities) for 2012 and the estimate of the magnitude of dead discards expected to occur in the absence of fishing. Depending on the method of estimating the 2012 discard mortalities, the range for the ACL is from 2,121 to 13,067 fish (**Table 1-1**). At their June 2012 meeting, the South Atlantic Council determined that 2012 allowable landings should be calculated using the average of 2010 and 2011 estimated mortalities plus the 2012 ABC of 86,000 fish (**Alternative 2c**). On August 1, 2012, the SEFSC certified that the proposed action is based upon the best scientific information available.

Table 1-1. The estimated discard mortalities for 2012 and potential allowable landings allocated to each sector.

Method for estimating 2012 discard mortalities	2012 Discard Mortalities		Potential Allowable Landings/ACL
	ABC (proj.)	Esti-mated	
2011 increased by change in 2011-2012 exploitable abundance (36.6%) (ABC)	86,000	83,879	Alternative 2a 2,121 fish Rec=1,526 fish Comm.=595 fish or 3,379 lbs gw
2011 mortalities increased by change in 2011-2012 exploitable abundance (ABC) and decreased by change in 2010-2011 fishing effort	86,000	77,016	Alternative 2b 8,984 fish Rec=6,462 fish Comm.=2,522 fish or 14,313 lbs gw
Average of 2010-2011 estimated mortalities and 2012 projected mortalities	86,000	72,933	Alternative 2c Preferred 13,067 fish Rec=9,399 fish Comm.=3,668 fish or 20,818 lbs gw

Source: SERO-LAPP-2012-04 2012 (Appendix C)

Estimated mortalities are the red snapper kill that have previously occurred through keeping the catch and discards as estimated through the current data collection programs.

Projected mortalities (or ABC) is the red snapper kill that is predicted to occur. The difference of the estimated and projected mortalities provide the ACL.

1.7 How Were the Length of the Seasons Determined?

Commercial

Once the total ACL and sector-ACLs are determined as described in the previous section, fishery managers must specify the season length. Chapter 2 specifies the season length alternatives. The objective is to specify a season length that would not result in landings exceeding the sector ACL, which would help ensure landings are below the 2012 ABC. The analysis supporting the season length determination is contained in **Appendix C**.

If the commercial fishing season opens in September 2012 as expected, the estimated days available before reaching the commercial ACL is between 6 to 152 days depending on the commercial trip limit implemented (**Table 1-2**). Based on the preferred commercial ACL of 20,818 lbs gutted weight (gw) and 50 lbs gw trip limit, the estimated commercial season length would be 68 days before the ACL is met. This assumes effort and catch rates of red snapper are comparable to 2009 levels prior to the prohibition on the harvest of red snapper.

Table 1-2. The estimated commercial season length in days under various commercial ACL (in pounds gutted weight (gw)) and trip limit scenarios if the season opens in September as expected.

Com-mercial ACL (lbs gw)	Trip Limit (lbs gw)			
	25 (Alt. 6a)	50 (Alt. 6b) (preferred)	75 (Alt. 6c)	100 (Alt. 6d)
3,379 (Alt. 2a)	22 days	11	7	6
14,313 (Alt. 2b)	96	47	31	23
20,818 (Alt. 2c) (preferred)	152	**68**	45	34

Source: SERO-LAPP-2012-04 2012 (Appendix C)

Methodology of the commercial trip limit and season length analysis
(Appendix C)

►Trip limits from 25 to 100 lbs were applied to logbook landings data from 2009, the last year the red snapper commercial sector was open.

►Trips were evaluated and if a trip reported landing red snapper above a specified trip limit, then landings were reduced to the trip limit.

►All trips landing quantities of red snapper below the trip limit were increased to the trip limit.

Based on logbook landings from 2011, the estimated allowable season length would be shortened from 68 to 14 days. During 2011, 107 vessels reported landings in statistical grids from Central-east Florida (Fort Pierce/Cape Canaveral) through Georgia of species associated with red snapper (red snapper was closed in 2011). (Commercial fishermen report logbook landings in statistical grids; the grids are approximately 60 by 60 nautical miles each.) These species include vermilion snapper, scamp, red porgy, black grouper, gag, red grouper, gray triggerfish, and greater amberjack. If each of these vessels made two trips per week and caught a 50 lb gw trip limit of red snapper, then the season would be open 14 days. If the 107 vessels each made three trips per week and caught a 50 lb gw trip limit, then the season would be open 9 days. Given that vessels off South Carolina and North Carolina would also be catching some red snapper, it is possible the season could be shorter than the 9 to 14 range.

In 2009, 1,997 logbook trips reported landing red snapper. Trips per month ranged from 113-235, or approximately 30-60 per week. During 2009, the maximum amount of pounds landed during a week was 21,423 pounds gutted weight between October 3-9, 2009. This amount

was landed by 44 vessels taking 60 trips. Logbook records indicate there were 107 vessels fishing in statistical zones from Central-east Florida (Fort Pierce/Cape Canaveral) through Georgia in 2011 that landed species commonly associated with red snapper (red snapper was closed in 2011). Commercial fishermen report logbook landings in statistical grids; the grids are approximately 60 by 60 nautical miles each. These species include vermilion snapper, scamp, red porgy, black grouper, gag, red grouper, gray triggerfish, and greater amberjack. If each of these vessels made two trips per week and caught a 50 lb gw trip limit of red snapper, then the projections show that the season would be open 14 days. If the 107 vessels each made three trips per week and caught a 50 lb gw trip limit, then the projections show that the season would be open 9 days. Given that vessels off South Carolina and North Carolina would also be catching some red snapper, it is possible the season could be shorter than the 9 to 14 day range.

Based on the analysis outlined above, fishery managers are proposing a seven-day commercial opening for red snapper in **Preferred Alternative 3**. As explained in **Section 6.3**, NOAA Fisheries will evaluate landings to determine if any additional days can be open in 2012.

Recreational

Fishery managers are proposing an opening of recreational fishing for red snapper in 2012. The analysis supporting the season length determination is contained in **Appendix C**.

If the recreational fishing season opens in September 2012 as expected, the estimated number of days available to fishing before reaching the preferred recreational ACL of 9,399 fish is between 2 to 24 days depending on two statistical scenarios of the model (**Table 1-3**).

Table 1-3. As estimated by Seasonal Autoregressive Integrated Moving Average Model (SARIMA), the recreational season length in days under each recreational ACL alternative (in numbers of fish) if the season opens in September as expected.

Recreational ACL (numbers of fish)	Estimated Recreational Season Length (days)	
	SARIMA mean	SARIMA 95% confidence interval
1,526 (Alt. 2a)	4 days	2
6,462 (Alt. 2b)	17	10
9,399 (Alt. 2c) (preferred)	24	14

Source: SERO-LAPP-2012-04 2012 (Appendix C)

The majority of private recreational fishermen fish on the weekends. To account for the higher fishing pressure on weekend days, the number of weekend days available under the preferred ACL alternative would be less than the number of consecutive days estimated to meet the level of landings specified in the preferred ACL alternative (between 14 to 24 days). Assuming 75 percent of a week's recreational landings are landed over the three-day weekend, 2.1-4.8 three-day weekends would be the equivalent of 11 to 25 consecutive days. Given uncertainties in estimated discard mortalities for 2012, and the potential for large shifts in fishing effort if red snapper are allowed to be harvested, the author of **Appendix C** recommends that the recreational fishing season be no longer than two to three consecutive three-day weekends. Taking this information into consideration, fishery managers created **Alternative 4**, which would establish two weekend-only openings in 2012 for the recreational sector (Friday, Saturday, Sunday) as a preferred alternative.

SARIMA = **S**easonal **A**utoregressive **I**ntegrated **M**oving **A**verage **M**odel

►Uses historical monthly landings and projected changes in exploitable abundance to predict future monthly landings

1.8 What is the History of Management for Red Snapper?

Red snapper regulations in the South Atlantic where first implemented in 1983. See **Appendix C** of Amendment 17A to the Snapper Grouper FMP for a detailed history of management for the snapper grouper fishery. Recent actions since the first SEDAR assessment in 2008 are presented in **Figure 1-3**.

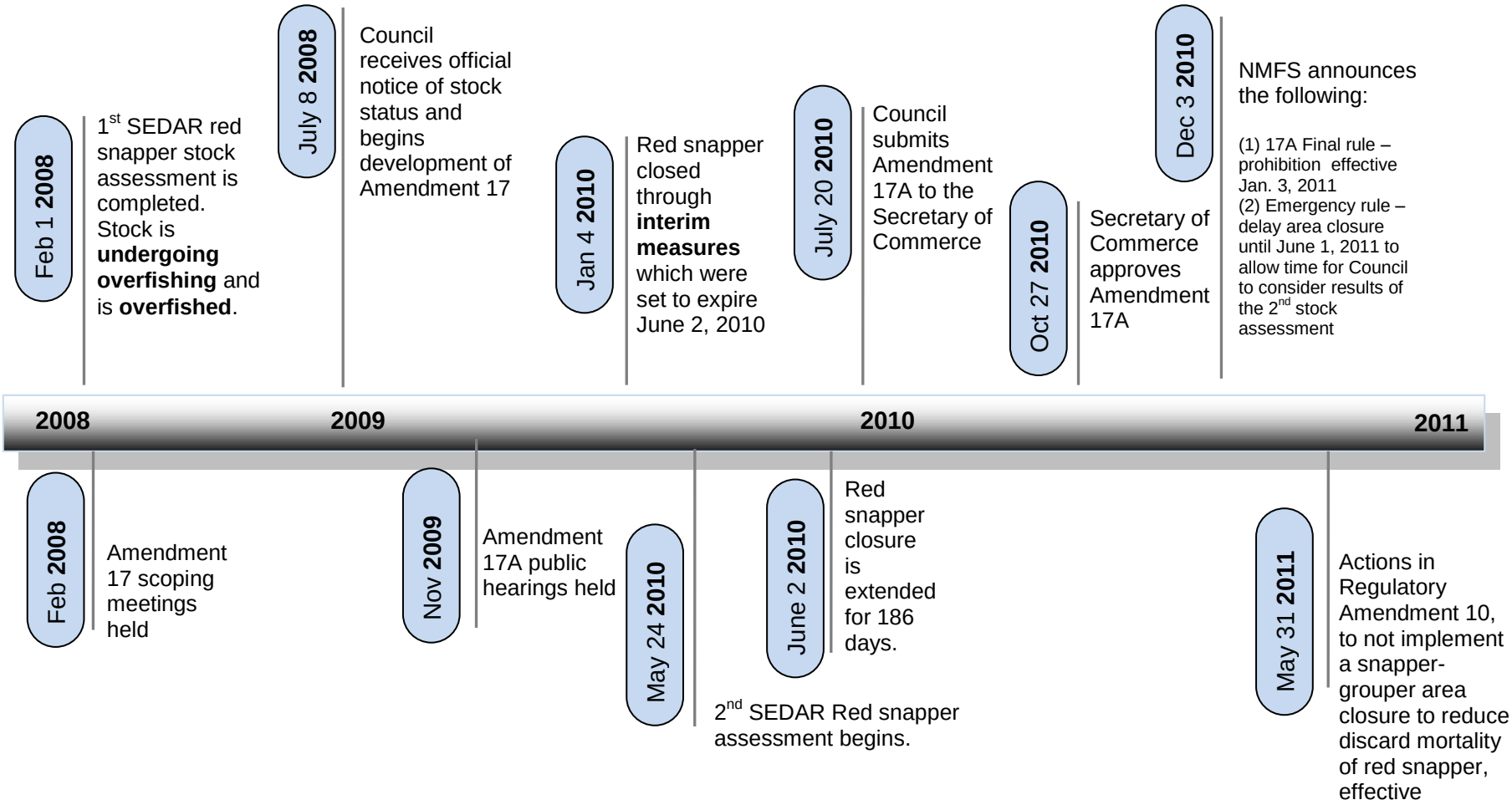


Figure 1-3. Timeline of recent red snapper management measures.

Chapter 2. Proposed Actions

2.1 Action 1. Allow Harvest and Possession of Red Snapper in 2012

2.1.1 Alternatives

Multiple alternatives and sub-alternatives may be chosen as preferred alternatives.

Alternative 1. (No action). The red snapper annual catch limit (ACL) equals zero (landings only). Red snapper may not be harvested or possessed in or from the South Atlantic exclusive economic zone (EEZ). The 20-inch total length (TL) minimum size limit and inclusion in the 10 fish snapper combined bag limit are currently not in effect as red snapper may not be harvested or possessed in or from the South Atlantic EEZ. The commercial and recreational allocations of red snapper are 28.07% and 71.93%, respectively. The accountability measures (AM) for red snapper, in addition to the harvest and possession prohibition, are as follows:

(1) Track CPUE of red snapper via a fishery-independent monitoring program to track changes in biomass and take action to end overfishing if assessment indicates progress is not being made.
(2) Track the biomass and CPUE through fishery-dependent sampling.
(3) CPUE would be evaluated every three years and adjustments would be made by the framework action.

RED SNAPPER REGULATIONS IN THE CODE OF FEDERAL REGULATIONS

50 C.F.R. § 622.32 Prohibited and limited-harvest species.
(3) South Atlantic.
(vi) Red snapper may not be harvested or possessed in or from the South Atlantic EEZ. Such fish caught in the South Atlantic EEZ must be released immediately with a minimum of harm. In addition, for a person on board a vessel for which a valid Federal commercial or charter vessel/headboat permit for South Atlantic snapper-grouper has been issued, the provisions of this closure apply in the South Atlantic, regardless of where such fish are harvested, i.e., in state or Federal waters.
§ 622.37 Size limits.
(e) South Atlantic snapper-grouper--(1) Snapper.
(v) Red snapper--20 inches (50.8 cm), TL, however, see § 622.32(b)(3)(vii) for the current prohibition on the harvest and possession of red snapper.
§ 622.39 Bag and possession limits.
(d) South Atlantic snapper-grouper--(1) Bag limits.
(iv) Snappers, combined--10. However, excluded from this 10-fish bag limit are cubera snapper, measuring 30 inches (76.2 cm), TL, or larger, in the South Atlantic off Florida, and red snapper and vermilion snapper. (See § 622.32(b)(3)(vii) for the prohibition on harvest and possession of red snapper and § 622.32(c)(2) for limitations on cubera snapper measuring 30 inches (76.2 cm), TL, or larger, in or from the South Atlantic EEZ off Florida.)
(ix) No red snapper may be retained.
§ 622.45 Restrictions on sale and purchase.
(d) South Atlantic snapper-grouper.
(10) No person may sell or purchase a red snapper harvested from or possessed in the South Atlantic, i.e., state or Federal waters, by a vessel for which a Federal commercial permit for South Atlantic snapper-grouper has been issued.

Alternative 2. Establish a temporary red snapper ACL for 2012 only.

Sub-alternative 2a. Establish a temporary red snapper ACL of 2,121 fish for 2012. Establish a temporary red snapper commercial ACL of 595 fish or 3,379 lbs gutted weight for 2012. Establish a temporary red snapper recreational ACL of 1,526 fish for 2012. The sector ACLs were calculated through use of the established allocations for red snapper (28.07% commercial; 71.93% recreational).

Sub-alternative 2b. Establish a temporary red snapper ACL of 8,984 fish for 2012. Establish a temporary red snapper commercial ACL of 2,522 fish or 14,313 lbs gutted weight for 2012. Establish a temporary red snapper recreational ACL of 6,462 fish for 2012. The sector ACLs were calculated through use of the established allocations for red snapper (28.07% commercial; 71.93% recreational).

Sub-alternative 2c (Preferred). Establish a temporary red snapper ACL of 13,067 fish for 2012. Establish a temporary red snapper commercial ACL of 3,668 fish or 20,818 lbs gutted weight for 2012. Establish a temporary red snapper recreational ACL of 9,399 fish for 2012. The sector ACLs were calculated through use of the established allocations for red snapper (28.07% commercial; 71.93% recreational).

Alternative 3 (Preferred). Establish a seven-day opening for 2012 for the commercial sector beginning on Monday following the first recreational three day opening. NMFS will compare landings to the ACL to determine if any additional days can be open in 2012. The temporary AM is the specification of the length of the opening and other management controls, the monitoring of landings, and the comparison of the landings to the ACL before potentially re-opening in 2012.

Alternative 4 (Preferred). Establish two weekend-only openings for 2012 for the recreational sector (Friday, Saturday, Sunday). NMFS will evaluate data to determine if any additional days can be open in 2012. The temporary AM is the specification of the length of the opening and other management controls.

Alternative 5 (Preferred). Suspend the red snapper commercial and recreational 20-inch TL minimum size limit for the duration of the temporary rule through emergency action.

Alternative 6. Establish a red snapper temporary commercial trip limit.

Sub-alternative 6a. Establish a red snapper temporary commercial trip limit of 25 lbs gutted weight per trip for the duration of the open 2012 commercial fishing season.

Sub-alternative 6b (Preferred). Establish a red snapper temporary commercial trip limit of 50 lbs gutted weight per trip for the duration of the open 2012 commercial fishing season.

Sub-alternative 6c. Establish a red snapper temporary commercial trip limit of 75 lbs gutted weight per trip for the duration of the open 2012 commercial fishing season.

Sub-alternative 6d. Establish a red snapper temporary commercial trip limit of 100 lbs gutted weight per trip for the duration of the open 2012 commercial fishing season.

Alternative 7 (Preferred). Establish a red snapper temporary recreational bag limit of one fish per person per day for the duration of the open 2012 recreational fishing season.

Note: After the conclusion of the commercial red snapper fishing season in 2012, red snapper may not be harvested or possessed by commercial fishermen in federal waters of the South Atlantic and in state waters for vessels holding federal snapper-grouper permits. After the conclusion of the recreational red snapper fishing season in 2012, red snapper may not be harvested or possessed by recreational fishermen in federal waters of the South Atlantic and in state waters for vessels holding federal snapper-grouper permits.

Chapter 3. Affected Environment

This section describes the affected environment in the proposed project area. The affected environment is divided into four major components:

Affected Environment

- **Habitat environment (Section 3.1)**

  Examples include coral reefs and sea grass beds

- **Biological end ecological environment (Section 3.2)**

  Examples include populations of red snapper, corals, turtles

- **Human environment (Section 3.3)**

  Examples include fishing communities and economic descriptions of the fisheries

- **Administrative environment (Section 3.4)**

  Examples include the fishery management process and enforcement activities

3.1 Habitat Environment

Many snapper grouper species utilize both open-water and bottom habitats during several life-history stages; larval stages of these species live in the water column and feed on plankton. Most juveniles and adults are bottom-dwellers and associate with hard structures on the continental shelf that have moderate to high relief (e.g., coral reef systems and artificial reef structures, rocky hard-bottom substrates, ledges and caves, sloping soft-bottom areas, and limestone outcroppings). Juvenile stages of some snapper grouper species also utilize inshore seagrass beds, mangrove estuaries, lagoons, oyster reefs, and embayment systems. In many species, various combinations of these habitats may be utilized during daily feeding migrations or seasonal shifts in cross-shelf distribution.

Predominant snapper grouper offshore fishing areas are located in live-bottom and shelf-edge habitats, where water temperatures range from 11° to 27°C (52° to 81°F) due to the proximity of the Gulf Stream, with lower shelf habitat temperatures varying from 11° to 14°C (52° to 57°F). Water depths range from 16 to 27 meters (54 to 90 feet) or greater for live-bottom habitats, 55 to 110 meters (180 to 360 feet) for the shelf-edge habitat, and from 110 to 183 meters (360 to 600 feet) for lower-shelf habitat areas.

Artificial reef structures are also utilized to attract fish and increase fish harvests; however, research on artificial reefs is limited and opinions

differ as to whether or not these structures promote an increase of ecological biomass or merely concentrate fishes by attracting them from nearby, natural unvegetated areas of little or no relief.

More detail on these habitat types is found in Volume II of the Council's Fishery Ecosystem Plan (SAFMC 2009b) available at: http://www.safmc.net/ecosystem/Home/EcosystemHome/tabid/435/Default.aspx

3.1.1 Essential Fish Habitat

Essential fish habitat (EFH) is defined in the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) as "those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S. C. 1802(10)). Specific categories of EFH identified in the South Atlantic Bight, which are utilized by federally managed fish and invertebrate species, include both estuarine/inshore and marine/offshore areas.

EFH utilized by snapper grouper species in the South Atlantic region includes coral reefs, live/hard bottom, submerged aquatic vegetation, artificial reefs and medium to high profile outcroppings on and around the shelf break zone from shore to at least 183 meters [600 feet (but to at least 2,000 feet for wreckfish)] where the annual water temperature range is sufficiently warm to maintain adult populations of members of this largely tropical fish complex. EFH includes the spawning area in the water column above the adult habitat and the additional pelagic environment, including *Sargassum*, required for survival of larvae and growth up to and including settlement. In addition, the Gulf Stream is also EFH because it provides a mechanism to disperse snapper grouper larvae.

For specific life stages of estuarine-dependent and near shore snapper grouper species, EFH includes areas inshore of the 30 meters (100-foot) contour, such as attached microalgae; submerged rooted vascular plants (seagrasses); estuarine emergent vegetated wetlands (saltmarshes, brackish marsh); tidal creeks; estuarine scrub/shrub (mangrove fringe); oyster reefs and shell banks; unconsolidated bottom (soft sediments); artificial reefs; and coral reefs and live/hard bottom habitats.

3.1.2 Habitat Areas of Particular Concern

Areas which meet the criteria for EFH-habitat areas of particular concern (EFH-HAPCs) for species in the snapper grouper management unit include medium to high profile offshore hard bottoms where spawning normally occurs; localities of known or likely periodic spawning aggregations; near shore hard bottom areas; The Point, The Ten Fathom Ledge, and Big Rock (North Carolina); The Charleston Bump (South Carolina); mangrove habitat; seagrass habitat; oyster/shell habitat; all coastal inlets; all state-designated nursery habitats of particular importance to snapper grouper (e.g., Primary and Secondary Nursery Areas designated in North Carolina); pelagic and benthic *Sargassum*; Hoyt Hills for wreckfish; the Oculina Bank Habitat Area of Particular Concern; all hermatypic coral habitats and reefs; manganese outcroppings on the Blake Plateau; and Council-designated Artificial Reef Special Management Zones (SMZs). Areas that meet the criteria for designating essential fish habitat-habitat areas of particular concern include habitats required during each life stage (including egg, larval, postlarval, juvenile, and adult stages).

3.2 Biological and Ecological Environment

The reef environment in the South Atlantic management area affected by actions in this environmental assessment is defined by two components (**Figure 3-1**). Each component will be described in detail in the following sections.

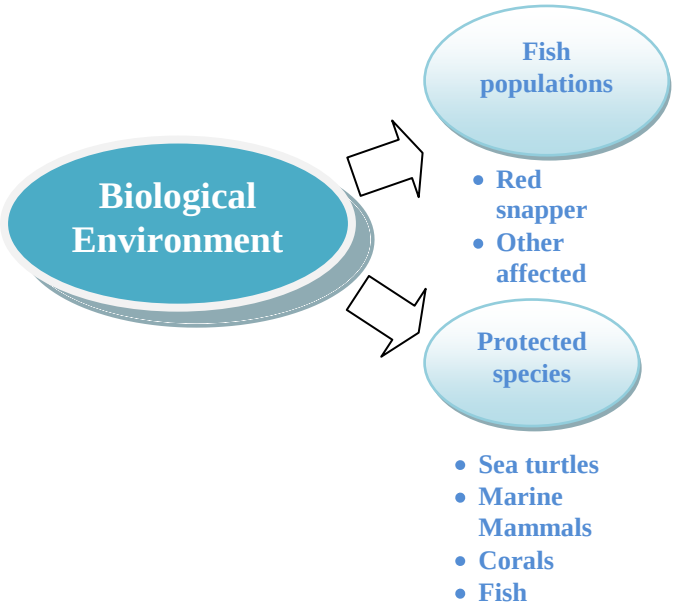


Figure 3-1. Two components of the biological environment described in this document.

3.2.1 Fish Populations

The waters off the South Atlantic coast are home to a diverse population of fish. The snapper grouper fishery management unit contains 60 species of fish, many of them neither "snappers" or "groupers". These species live in depths from a few feet (typically as juveniles) to hundreds of feet. As far as north/south distribution, the more temperate species tend to live in the upper reaches of the South Atlantic management area (black sea bass, red porgy) while the tropical variety's core residence is in the waters off south Florida, Caribbean Islands, and northern South America (black grouper, mutton snapper).

These are reef-dwelling species that live amongst each other. These species rely on the reef environment for protection and food. There are several reef tracts that follow the southeastern coast. The fact that these fish populations congregate together dictates the nature of the fishery (multi-species) and further forms the type of management regulations proposed in this document.

Snapper grouper species commonly taken with red snapper could be affected by the action. In addition to red snapper, snapper grouper species most likely to be affected by the proposed actions includes many species that occupy the same habitat at the same time. Therefore, snapper grouper species are likely to be caught when regulated since they will be incidentally caught when fishermen target other co-occurring species (See Section 3.2.5 for a discussion of the co-occurring species).

3.2.2 Red Snapper, *Lutjanus campechanus*

The red snapper is found from North Carolina to the Florida Keys, and throughout the Gulf of Mexico to the Yucatan Peninsula (Robins and Ray 1986). It can be found at depths from 10 to 190 m (33-623 feet). Adults usually occur over rocky bottoms. Juveniles inhabit shallow waters and are common over sandy or muddy bottom habitat (Allen 1985) **(Figure 3-2).**

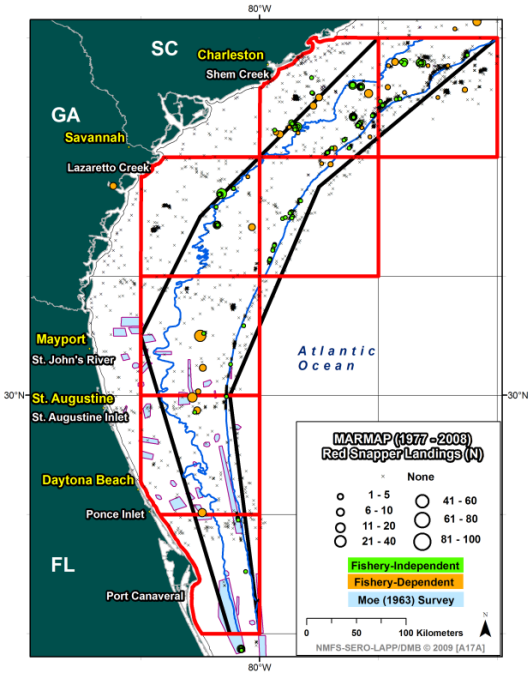
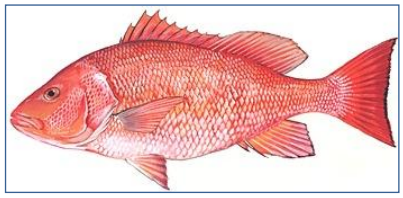


Figure 3-2. Distribution of red snapper taken by MARMAP in fishery-independent and fishery-dependent samples as well as locations where Moe (1963) reported red snapper.

The maximum size reported for this species is 100 cm (40 inches) total length (TL) (Allen 1985, Robins and Ray 1986) and 22.8 kg (50 lbs) (Allen 1985). Maximum reported age in the Gulf of Mexico is reported as 53 years by Goodyear (1995) and 57 years by Allman *et al.* (2002). For samples collected from North Carolina to eastern Florida, maximum reported age is 45 years (White and Palmer 2004). McInerny (2007) reports a maximum age of 54 years for red snapper in the South Atlantic. Natural mortality (M) is estimated to be 0.078 using the Hoenig (1983) method with a maximum age of 53 years (SEDAR 15 2008). The value of M used in SEDAR 24 (2010) based on the Hoenig (1983) method was 0.08. Manooch *et al.* (1998) estimated M at 0.25 but the maximum age in their study was 25 years (Manooch and Potts 1997).

In the U.S. South Atlantic and in the Gulf of Mexico, Grimes (1987) reported that size of red snapper at first maturity is 23.7 cm (9.3 inches) fork length. For red snapper collected along the Southeastern United States, White and Palmer (2004) found that the smallest mature male was 20.0 cm (7.9 inches) TL, and the largest immature male was 37.8 cm (15 in) TL. Fifty percent of males are mature at 22.3 cm (8.8 in) TL, while 50% of females are mature at 37.8 cm (15 in) TL. Males are present in 86% of age 1, 91% of age 2, 100% of age 3, 98% of age 4, and 100% of older age fish. Mature females are present in 0% of age 1, 53% of age 2, 92% of age 3, 96% of age 4, and 100% of older age individuals. Grimes (1987) found that the spawning season of this species varies with location, but in most cases occurs nearly year round. White and Palmer (2004) reported that the spawning season for female red snapper off the southeastern United States extends from May to October, peaking in July through September. Red snapper eat fishes, shrimps, crabs, worms, cephalopods, and some planktonic items (Szedlemayr and Lee 2004).

Red Snapper Life History
An Overview



- Extend from North Carolina to the Florida Keys, and throughout the Gulf of Mexico to the Yucatan Peninsula
- Waters ranging from 33-623 feet
- Red snapper do not migrate but can move long distances
- The spawning season extends from May to October, peaking in July through September.
- Can live for at least 54 years

Among red snapper, larger fish aren't always older fish

There is a great deal of variability in the age of red snapper at larger sizes. For example, the average size of a 10 year old red snapper is around 32 inches, but 10 year old fish range in size from 27 to 40 inches in length. Fish are currently being caught before they become old enough to reach their peak reproductive levels. Increasing the abundance of older, mature fish is important to long-term sustainability.

3.2.3 Stock Status of Red Snapper

Stock assessments, through the evaluation of biological and statistical information, provide an evaluation of stock health under the current management regime and other potential future harvest conditions. More specifically, the assessments provide an estimation of maximum sustainable yield (MSY) and a determination of stock status (whether *overfishing* is occurring and whether the stock is *overfished*).

The Southeast Data, Assessment, and Review (SEDAR) process, initiated in 2002, is a cooperative Fishery Management Council process intended to improve the quality, timeliness and reliability of fishery stock assessments in the South Atlantic, Gulf of Mexico, and US Caribbean. SEDAR is managed by the Caribbean, Gulf of Mexico, and South Atlantic Fishery Management Councils in coordination with NOAA Fisheries and the Atlantic and Gulf States Marine Fisheries Commissions. SEDAR emphasizes constituent and stakeholder participation in assessment development, transparency in the assessment process, and a rigorous and independent scientific review of completed stock assessments.

Following an assessment, the South Atlantic Fishery Management Council's (South Atlantic Council) Scientific and Statistical Committee (SSC) reviews the stock assessment information and advises the South Atlantic Council on whether the stock assessment was performed utilizing the best available data and whether the outcome of the assessment is suitable for management purposes.

The results of SEDAR 24, utilizing the most recent data from 2009, determined that the red snapper stock to be undergoing overfishing and overfished **(Table 3-1).** The South Atlantic Council, through Amendments 17A to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP) and Regulatory Amendment 10 to the Snapper Grouper FMP, took action to end overfishing and begin rebuilding the stock. See **Section 1.6** for a history of recent management of red snapper.

Table 3-1. Stock status of red snapper.

Alt.	SEDAR 24 (2009 most recent data)
Overfishing (F_{CURR}/MFMT value)	Yes (4.1)
Overfished (B_{CURR}/MSST value)	Yes (0.09)

- If F_{CURR}>MFMT, then undergoing overfishing. The higher the number, the greater degree of overfishing.
- If B_{CURR}<MSST, then overfished. The lower the number, the greater degree of overfished.
- Note: The stock status is from the base run. Changing the base run changes the level of overfishing/overfished.

It is important to note that the SEDAR Review Panel stated the following in the Review Workshop Report (SEDAR 24 2010):

"The panel suggests using the AW (Assessment Workshop) base case model to provide historical and current estimates of stock abundance, biomass, and exploitation, but cautions that this is one realization of a number of plausible runs and is conditioned on particular assumptions made about the data and population dynamics model that may change in future assessments."

The SSC reviewed the assessment at their November 2010 meeting and approved it as the best available science and usable for management purposes. The SSC discussed how to use the model results to provide fishing level recommendations to the South Atlantic Council (SSC Report 2010). The SSC decided to base their recommendations on three runs of the model using different "weights" for the headboat index since the latter was considered the most reliable. A weight function is used to give some elements more "weight" or influence on the results than other elements in the same model. The base run used a headboat (hb) weight of 0.11. The SSC chose to use three weights for the headboat index (hb = 0.2, hb = 0.25, and hb = 0.3) and base their catch level advice on the projections from each of these three model configurations. The South Atlantic Council adopted the ABC corresponding to the headboat index of 0.30. The proposed ACLs in this amendment are based on an ABC of 541,000 lbs whole weight in 2012.

3.2.4 Recent Mortality Estimates of Red Snapper

The Southeast Fisheries Science Center (SEFSC) has provided mortality estimates to fishery managers **(Table 3-2)**. At their June 11-15, 2012, meeting, the Council reviewed new information including these recent estimates of mortality. Despite the harvest and possession prohibition, red snapper landings have been reported **(Table 3-2)**.

Table 3-2. Total mortalities by fleet (units=number of fish).

Sector		2010	2011
For-hire	Landed	971	1950
	Discard mortalities	20569	22131
Private recreational	Landed	0	0
	Discard mortalities	31561	16156
Commercial	Landed	0	0
	Discard mortalities	18293	21169

3.2.5 Other Fish Species Affected

In addition to red snapper, snapper grouper species most likely to be affected by the proposed actions includes many species that occupy the same habitat at the same time. Therefore, snapper grouper species are likely to

be incidentally caught when fishermen target co-occurring species. The following species are ones that are most likely to be affected. Amendment 17A to the Snapper Grouper FMP (SAFMC 2010a) **Section 3.2.1**, describes their life history characteristics in detail.

black sea bass
(*Centropristis striata*)

gag
(*Mycteroperca microlepis*)

gray triggerfish
(*Balistes capriscus*)

greater amberjack
(*Seriola dumerili*)

red grouper
(*Epinephelus morio*)

scamp
(*Mycteroperca phenax*)

vermilion snapper
(*Rhomboplites aurorubens*)

3.2.6 Protected Species

There are 31 different species of marine mammals that may occur in the exclusive economic zone (EEZ) of the South Atlantic region. All 31 species are protected under the Marine Mammal Protection Act (MMPA) and six are also listed as endangered under the Endangered Species Act (ESA) (i.e., sperm, sei, fin, blue, humpback, and North Atlantic right whales). In addition to those six marine mammals, five species of sea turtle (green, hawksbill, Kemp's ridley, leatherback, and loggerhead); the smalltooth sawfish; and two *Acropora* coral species (elkhorn [*Acropora palmata*] and staghorn [*A. cervicornis*]) are protected under the ESA. **Section 3.5** of Amendment 17A to the Snapper Grouper FMP, describes life history characteristics in detail and discusses the previous ESA section 7 determinations of impacts from the snapper grouper fishery on these species.

NOAA Fisheries drafted a biological opinion, dated June 7, 2006, titled, "The Continued Authorization of Snapper-Grouper Fishing in the U.S. South Atlantic Exclusive Economic Zone (EEZ) as Managed Under the Snapper-Grouper Fishery Management Plan of the South Atlantic Region (SGFMP), Including Amendment 13C to the SGFMP." Subsequent to the biological opinion, five distinct population segments (DPS) of Atlantic sturgeon and two *Acropora* species occurring in the Southeast Region were listed (effective April 6, 2012); and *Acropora* critical habitat was designated. Additionally, on September 22, 2011, NOAA Fisheries and the U.S. Fish and Wildlife Service determined the loggerhead sea turtle population consists of nine DPSs (76 FR 58868). Previously, loggerhead sea turtles were listed as threatened species throughout their global range. The snapper-grouper fishery interacts with loggerhead sea turtle from what is now considered the Northwest Atlantic DPS, which remains listed as threatened. The Atlantic sturgeon (*Acipenser oxyrhincus*) has been recently listed under the ESA.

3.3 Socio-economic Environment

3.3.1 Economic Description of the Commercial Fishery

A recent description of the commercial component of the snapper grouper fishery is contained in Amendment 17A (SAFMC 2010a) and Regulatory Amendment 10 (SAFMC 2010b) and is incorporated herein by reference. The

following is brief summary and updated information, where available. Note that Amendment 17A expressed real dollars in terms of 2007 dollars while Regulatory Amendment 10 used 2008 dollars. For the current update in this Emergency Action, all dollar values have been converted to 2011 dollars. However, in estimating economic activities using the latest 5-year average, dollar values are expressed in 2008 dollars to be consistent with the available economic impact (business activity) model.

SAFMC (2010) contains numerous average annual (2003-2007) commercial sector performance statistics. Updates of all these statistics through 2011 are not available. Select statistics updated through 2011 are provided in the following paragraphs.

SAFMC (2010) reported average annual commercial landings of all snapper grouper species in the South Atlantic from 2003-2007 of approximately 6.43 million lbs with an ex-vessel value of approximately $14.98 million. The corresponding average figures for 2008-2011 are 5.03 million lbs valued at $13.66. The resulting most recent five-year average (2007-2011) harvest totals are approximately 5.33 million lbs valued at $14.28 million in 2011 dollars, or $13.66 million in 2008 dollars.

All harvests (all trips and all species) by all vessels harvesting snapper grouper averaged approximately 11.24 million lbs valued at $24.74 million over 2003-2007 (SAFMC 2010a, with some corrections based on the most recent logbook data). Comparable average figures for 2008-2011 are 12.21 million lbs valued at $23.86 million. The most recent five year average (2007-2011) harvest is 12.21 million lbs valued at $19.09 million.

During 2003-2007, an average of 890 commercial vessels per year harvested snapper grouper species and took an annual average of 14,665 trips. The corresponding figures for 2008-2011 are 865 vessels and 14,271 trips.

In 2003-2007, the largest portion of snapper grouper harvests was landed in Georgia and Florida (Georgia landings combined with Florida for confidentiality considerations), or approximately 46%, followed by North Carolina (28%), and South Carolina (25%). The distribution of revenues followed the same pattern but slightly differed in percentage levels, with Georgia/Florida accounting for about 49% of total revenues, followed by North Carolina (26%) and South Carolina (25%). This relative distribution of snapper grouper landings and revenues by state has largely remained the same for 2008-2011: Florida/Georgia accounted for 52% of landings and 47% of revenues, North Carolina for 28% of landings and 27% or revenues, and South Carolina for 20% of landings and 26% of revenues.

In 2003-2007, snapper grouper landings were mostly caught by hook and line (81%), with longline accounting for 6% of landings and other gear types at 13%. This relative distribution of landings by gear type remained the same for 2008-2011, although the share of hook and line fell slightly to 79% and the longline share slightly increased to 9%.

The landings of red snapper in 2003-2007 averaged annually at approximately 121,000 valued at $421,000. Noting that since 2010, harvest and sale of red snapper has been prohibited, only the 2008 and 2009 landings and revenues may be updated. For these two years, red snapper landings averaged at about 309,000 lbs valued at $505,000. Georgia/Florida accounted for most of the landings and revenues at about 89% of total red snapper landings. Red snapper revenues over a 5-year period (2005-2009) averaged at approximately $612,000 (2008 dollars).

Estimates of the economic impacts (business activity) associated with the commercial snapper grouper fishery are derived using the model developed for and applied in USDOC (2009). Based on the average annual ex-vessel revenues for all snapper grouper species over the period 2007-2011 of $13.66 million, the commercial snapper grouper fishery is estimated to support 2,575 full time equivalent (FTE) jobs and generate approximately $180 million in output (sales) impacts and approximately $77 million in income impacts per year to the U.S. economy. Among the jobs supported, 336 FTE jobs are estimated to be in the harvesting sector and 205 FTE jobs are in the dealer/processor sector. Approximately two-thirds of the jobs supported by the commercial snapper grouper fishery are estimated to accrue to the restaurant sector. The estimates of economic activity include the direct effects (effects in the sector where an expenditure is actually made), indirect effects (effects in sectors providing goods and services to directly affected sectors), and induced effects (effects induced by the personal consumption expenditures of employees in the direct and indirectly affected sectors).

It is noted that the harvest of red snapper has been prohibited during 2010. During 2005-2009, commercial harvest of red snapper averaged approximately 171,000 valued at approximately $612,000 (2008 dollars) per year. The business activity associated with these revenues is 115 full time equivalent (FTE) jobs, approximately $8 million in output (sales) impacts and approximately $3 million in income impacts per year to the U.S. economy. As a result of the prohibition on the harvest of red snapper, the persistence of the average annual snapper grouper revenues and associated business activity would not be expected to occur but would, instead, be expected to be reduced by some portion of the losses attributable to the reduction in red snapper harvests. The full loss, however, may not occur if harvests of other species were able to be increased to compensate for the red snapper losses.

In 2003-2007, commercial snapper grouper permits averaged at 944, of which 749 were transferable and 195 were non-transferable. Transferable permits have no overall harvest limit of snapper grouper per trip. Note however that certain snapper grouper species, such for example as gag, vermilion snapper, and black sea bass are subject to trip limits. On the other hand, non-transferable permits are restricted to an overall harvest limit of 225 lbs per trip. The comparable numbers for 2008-2010 were 788 total permits, of which 643 were transferable permits and 145 transferable permits. According to the Southeast Regional Office Website, the Constituency Services Branch (Permits) unofficially listed 694 current holders of commercial snapper grouper permits as of July 9, 2012. Of these permits, 568 are transferable and 126 are non-transferable.

Imports continue to be a major source of seafood supply in the United States. During 2007-2011, imports of fresh and frozen snappers and groupers averaged 43.4 million lbs (product weight), valued at $104 million. Although fresh local product may benefit from some higher prices in some markets, the dominance of imports in the total snapper grouper market would be expected to exert limits on the movement of domestic ex-vessel prices resulting from changes in domestic landings.

3.3.2 Economic Description of the Recreational Fishery

A description of the recreational component of the snapper grouper fishery is contained in Amendment 17A (SAFMC 2010a) and Regulatory Amendment 10 (SAFMC 2010b) and is incorporated herein by reference. The following is a brief summary and updated information, where available.

SAFMC (2010b) reported that recreational snapper grouper harvest in the South Atlantic averaged approximately 10.8 million lbs per year during 2005-2009. Private boat anglers accounted for the largest harvests, accounting for approximately 6.1 million lbs, followed by shore anglers (1.7 million lbs), charter anglers (1.6 million lbs), and headboat anglers (1.4 million lbs). In 2010-2011, the recreational snapper grouper harvest averaged approximately 11.8 million lbs annually, with 6.7 million lbs contributed by the private mode, 2.7 million lbs by the shore mode, 1.2 million lbs by the charter mode and 1.2 million lbs by headboats.

In 2003-2008, red snapper harvest in the South Atlantic averaged approximately 403,000 lbs (SAFMC 2010a). Most red snapper harvests were taken by the private/rental mode (231,000 lbs), followed by the charter mode (110,000 lbs) and headboat (62,000 lbs). Although red snapper harvest in the South Atlantic has been prohibited since 2010, some fish continued to be harvested by the recreational sector. In 2009-2011, recreational red snapper harvest averaged about 346,000 lbs although most of these were harvested in 2009. The private/rental mode harvested most of red snapper (220,000 lbs), followed by the charter mode (75,000 lbs) and headboat (51,000 lbs). In 2005-2009, recreational harvest of red snapper averaged approximately 557,000 lbs per year. In 2005-2009, recreational harvest of red snapper averaged approximately 557,000 lbs per year.

Recreational effort derived from the Marine Recreational Statistics Survey (MRFSS) database can be characterized in terms of the number of trips as follows:

1. Target effort - The number of individual angler trips, regardless of duration, where the intercepted angler indicated that the species or a species in the species group was targeted as either the first or the second primary target for the trip. The species did not have to be caught.
2. Catch effort - The number of individual angler trips, regardless of duration and target intent, where the individual species or a species in the species group was caught. The fish did not have to be kept.
3. Total recreational trips - The total estimated number of recreational trips in the South Atlantic, regardless of target intent or catch success.

SAFMC (2010b) reported that over the years 2005-2009, an average of approximately 945,000 individual angler trips per year targeted snapper grouper species across all modes and states in the South Atlantic, or approximately 4% of all recreational shore, charter, and private angler trips. Snapper grouper target effort was highest in Florida, approximately 694,000 trips per year, and in the private mode, approximately 626,000 trips per year. In 2010-2011, total angler target trips for snapper grouper dropped to about 826,000 per year. This still comprised about 4% of all recreational shore, charter, and private angler trips. Florida accounted for the highest number of target trips at about 579,000 trips and the private mode accounted for the highest number of target trips at 592,000 trips. For the most recent five years (2007-2011), total target effort for snapper grouper in the South Atlantic averaged 906,106 trips annually. For the most recent five years (2007-2011), total target effort for snapper grouper in the South Atlantic averaged 906,106 trips annually.

Substantially more recreational trips catch than target any of the snapper grouper species in the South Atlantic. SAFMC (2010a) reported that during 2003-2008 an average of approximately 3.5 million individual angler trips in just the shore, private boat, and charter modes caught snapper grouper each year. Over 80% if these trips occurred off Florida. In 2009-2011, an average of about 2.8 million angler trips with

the shore, private, and charter modes caught snapper grouper, with about 76% occurring off Florida. In 2005-2009, recreational catch effort for snapper grouper in the South Atlantic averaged approximately 2.7 million trips per year. The corresponding average catch effort for the most recent five years (2007-2011) is 3.3 million trips per year. In 2005-2009, recreational catch effort for snapper grouper in the South Atlantic averaged approximately 2.7 million trips per year. The corresponding average catch effort for the most recent five years (2007-2011) is 3.3 million trips per year.

Similar to the discussion for the commercial sector, the harvest of red snapper was prohibited in the recreational sector in 2010. SAFMC (2010b) reported that red snapper target effort averaged approximately 57,300 trips per year in the South Atlantic during 2005-2009. While the prohibition of harvest needs not result in the cancellation of a target trip, the popularity of red snapper as a food fish, as opposed to being primarily a sport fish suggests that target effort would be expected to decline in response to the harvest prohibition. In 2010, red snapper target effort significantly dropped to about 4,000 trips and became practically non-existent in 2011.

As with catch trips for snapper grouper, catch trips for red snapper were also greater than target trips. In 2003-2008, catch trips for red snapper averaged 88,500 annually (SAFMC 2010a). In 2009-2011, red snapper catch trips averaged about 53,000 annually, although in 2010-2011 red snapper catch trips averaged only about 27,000 annually. In 2005-2009, red snapper catch trips averaged 94,000 per year. For the most recent five years (2007-2011) total catch effort for red snapper averaged about 79,000 trips per year.

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Similar analysis of recreational effort is not possible for the headboat sector because headboat data are not collected at the angler level. Estimates of effort in the headboat sector are provided in terms of angler days, or the number of standardized 12-hour fishing days that account for the different half-, three-quarter-, and full-day fishing trips by headboats. Despite the inability to associate headboat effort with specific species, the stationary bottom nature of headboat fishing, as opposed to trolling, suggests that most headboat trips and, hence, angler days, are snapper grouper trips by intent. SAFMC (2010b) reported that over the years 2005-2009, an average of approximately 225,000 angler trips were taken each year in the South Atlantic. The majority of these trips, approximately 153,000 trips per year, were taken in Georgia-Florida (Georgia is combined with Florida because of confidentiality considerations). In 2010-2011, anglers in the South Atlantic took an average of 188,000 trips. Georgia-Florida, with an average of about 144,000 trips, accounted for most of the trips.

SAFMC (2010a) reported an average of 1,811 snapper grouper for-hire permits in the South Atlantic for the period 2003-2008. In 2009-2010, South Atlantic snapper grouper for-hire permits averaged 1,953. In both periods, most permit holders listed Florida as their homeport state. According to the Southeast Regional Office Website, the Constituency Services Branch (Permits) unofficially listed 1,524 current holders of South Atlantic for-hire snapper grouper permits as of July 9, 2012.

Participation, effort, and harvest are indicators of the value of saltwater recreational

fishing. However, a more specific indicator of value is the satisfaction that anglers experience over and above their costs of fishing. The monetary value of this satisfaction is referred to as consumer surplus. The value or benefit derived from the recreational experience is dependent on several quality determinants, which include fish size, catch success rate, and the number of fish kept. These variables help determine the value of a fishing trip and influence total demand for recreational fishing trips.

SAFMC (2010a) and SAFMC (2010b) contain discussions on estimates of the consumer surplus (CS) associated with fishing for snapper grouper derived from different studies, including Haab et al. (2009), Dumas et al. (2009), and NMFS (2009). The estimated CS per snapper grouper (individual fish) used in the analysis of the expected effects of the management changes proposed in SAFMC (2010a) was $80 (2009 dollars). More recently, Carter and Liese (2012) estimated CS values for various species, with the CS value for red snapper equal to $62.97 (2003 dollars) for the second fish harvested. They also estimated red snapper CS values of $11.08 (2003 dollars) for the second fish released due to size limit and $6.86 (2003 dollars) for the second fish released due to the bag limit.

While anglers receive economic value as measured by the consumer surplus associated with fishing, for-hire businesses receive value from the services they provide. Producer surplus is the measure of the economic value these operations receive. Producer surplus is the difference between the revenue a business receives for a good or service, such as a charter or headboat trip, and the cost the business incurs to provide that good or service. Estimates of the producer surplus associated with for-hire trips are not available. However, proxy values in the form of net operating revenues are available (David Carter, NMFS SEFSC, personal communication, August 2010). These estimates were culled from several studies – Liese *et al.* (2009), Dumas *et al.* (2009), Holland *et al.* (1999), and Sutton *et al.* (1999). SAFMC (2010a) utilized a value of $128 (2009 dollars) per charter angler trip to assess the expected change in net operating revenues of the proposed management changes on charter vessels. In a more recent study, Holland et al. (2012) reported that charter vessels in the South Atlantic had average revenues of approximately $106,000 per vessel in 2009.

Net operating revenues per angler trip are lower for headboats than for charterboats. Net operating revenue estimates for a representative headboat trip are $48 in the Gulf of Mexico (all states and all of Florida), and $63-$68 in North Carolina. For full-day and overnight headboat trips, net operating revenues are estimated to be $74-$77 in North Carolina. Comparable estimates are not available for Georgia and South Carolina. SAFMC (2010a) utilized a value of $68 (2009 dollars) per headboat angler trip to assess the expected change in net operating revenues of the proposed management changes on headboat vessels. Holland et al. (2012) reported that headboats in the South Atlantic had average revenues of approximately $188,000 per vessel in 2009.

These value estimates should not be confused with angler expenditures or the economic activity (impacts) associated with these expenditures. While expenditures for a specific good or service may represent a proxy or lower bound of value (a person would not logically pay more for something than it was worth to them), they do not represent the net value (benefits minus cost), nor the change in value associated with a change in the fishing experience.

Estimates of the economic impacts (business activity) associated with the recreational snapper grouper fishery were derived using average output (sales) and job (FTE) impact coefficients for recreational angling across all fisheries

(species), as derived by an economic add-on to the Marine Recreational Fisheries Statistical Survey (MRFSS), and described and utilized in USDOC (2009). Estimates of the average expenditures by recreational anglers are provided in USDOC (2009) and are incorporated herein by reference. Estimates of the average snapper grouper effort (2007-2011) and associated business activity (2008 dollars) are provided in **Table 3-3**. Snapper grouper target trips were selected as the measure of snapper grouper effort. Consistent with the distribution of snapper grouper target effort, the largest amount of business activity associated with snapper grouper fishing occurs in Florida (across all modes), and the contributions by private/rental mode anglers were the greatest. It should be noted that output impacts and value added impacts are not additive. Also, the impacts cannot be added across states to generate a regional total because impacts for individual states reflect (are reduced by) leakage of business activity into neighboring states. In a regional model (all four states combined), expenditures flowing from, for example from Georgia to Florida, would remain in the region and continue to be counted. Regional estimates of business activity are not available.

Table 3-3. Summary of snapper grouper target trips (2005-2009 average) and associated economic impacts (2008 dollars). Output and value added impacts are not additive.

	North Carolina	South Carolina	Georgia	Florida
	Shore Mode			
Target Trips	9,670	25,475	6,475	194,795
Output Impact	$2,422,010	$2,594,068	$104,298	$5,564,825
Value Added Impact	$1,348,706	$1,444,439	$62,540	$3,230,686
Jobs	29	32	1	59
	Private/Rental Mode			
Target Trips	92,797	73,343	26,749	442,414
Output Impact	$5,065,182	$3,226,950	$417,919	$16,729,951
Value Added Impact	$2,856,099	$1,882,882	$253,503	$9,997,035
Jobs	54	37	4	176
	Charter Mode			
Target Trips	5,140	1,980	446	26,822
Output Impact	$2,000,917	$667,711	$28,037	$10,511,585
Value Added Impact	$1,122,919	$377,229	$16,364	$6,188,466
Jobs	25	9	0	108
	All Modes			
Target Trips	107,607	100,798	33,670	664,031
Output Impact	$9,488,109	$6,488,729	$550,254	$32,806,361
Value Added Impact	$5,327,724	$3,704,550	$332,406	$19,416,186
Jobs	109	77	5	343

Source: effort data from the MRFSS, economic impact results calculated by NMFS SERO using the model developed for USDOC (2009).

As noted in the previous paragraph, the values provided in **Table 3-3** reflect only effort derived from the MRFSS. Because the headboat sector in the Southeast is not covered in the MRFSS, the results in **Table 3-3** do not include estimates of the business activity associated with headboat anglers. Although estimates of the business activity associated with the headboat sector were provided in SAFMC (2010a), these estimates were based on the model parameters appropriate for the charterboat sector, which are higher than would be expected for the headboat sector because of higher fees charged by charter vessels and other factors discussed in SAFMC (2010a). As a result, these estimates are not repeated here and updated, more appropriate estimates of the business activity associated with the headboat component of the snapper grouper fishery are not available.

3.3.3 Social Environment

More detailed descriptions of the social environment for the red snapper fishery appear in the SAFMC (2009; 2010a; 2011a; 2011b) which include demographic information at the county level for areas of substantial red snapper fishing activity. Communities with substantial landings of snapper grouper species were identified in SAFMC (2010c) with demographic descriptions for those communities. Figure 3.3.1.1 below provides a depiction of red snapper regional quotient landings and value of landings for South Atlantic communities. A regional quotient is the amount of local landings and/or value divided by the total landings and value for the region. For this analysis, total landings for Florida Keys communities were included as we are unable to disaggregate landings at the community level to Gulf or Atlantic at this time. Values for pounds and value of landings are not reported to address confidentiality concerns, yet **Figure 3-3** still provides a glimpse of the proportion of red snapper that is landed by the top fifteen communities.

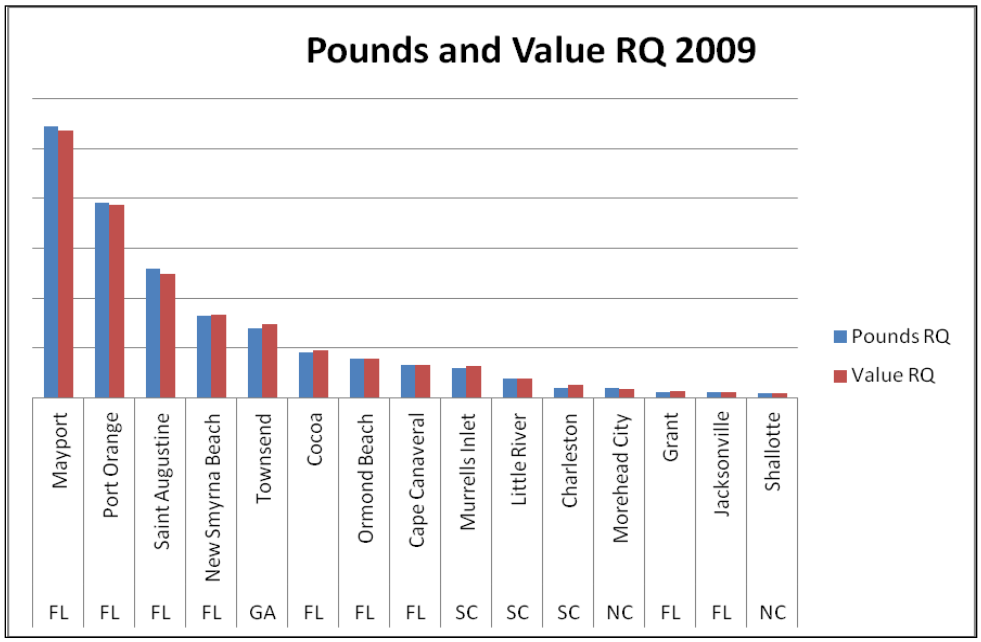

Figure 3-3. Pounds and Value RQ for South Atlantic Red Snapper

To better understand how South Atlantic red snapper fishing communities are engaged and reliant on fishing, indices were created using secondary data from permit and landings information for the commercial sector and permit information for the recreational sector (Colburn and Jepson, 2012; Jacob et al., 2012). Fishing engagement is primarily the absolute numbers of permits, landings and value. For commercial fishing, the analysis used the number of vessels designated commercial by homeport and owner address, value of landings and total number of commercial permits for each community. For receational engagement we used the number of recreational permits, vessels designated as recreational by homeport and owners address. Fishing reliance has the same variables as engagement divided by population to give an indication of the per capita impact of this activity.

Using a principal component and single solution factor analysis each community receives a factor score for each index to compare to other communities. Taking the fifteen communities in **Figure 3-3**,

factor scores of both engagement and reliance for both commercial and recreational fishing were plotted onto radar graphs. Each community's factor score is located on the axis radiating out from the center of the graph to its name. Factor scores are connected by colored lines and are standardized, therefore the mean is zero. Two thresholds of one and ½ standard deviation above the mean are plotted onto the graphs to help determine a threshold for significance. The factor scores are standardized therefore a score above 1 is also above one standard deviation. If factor scores above ½ standard deviation are rounded they would also be equal to one standard deviation.

In **Figure 3-4**, several communities have factor scores that exceed 1/2 standard deviation above the mean for commercial engagement and reliance. The communities of Cape Canaveral, FL; Jacksonville, FL; St. Augustine; Mayport, FL; Townsend, GA; Morehead City, NC; Shallotte, NC; Charleston, SC; Little River, SC; and Murrell's Inlet, SC and St. Augustine, FL all exceed the threshold of 1/2 standard deviation above the mean for commercial fishing engagement or reliance. Mayport, FL and Townsend, GA are two communities that exceed the threshold for both engagement and reliance.

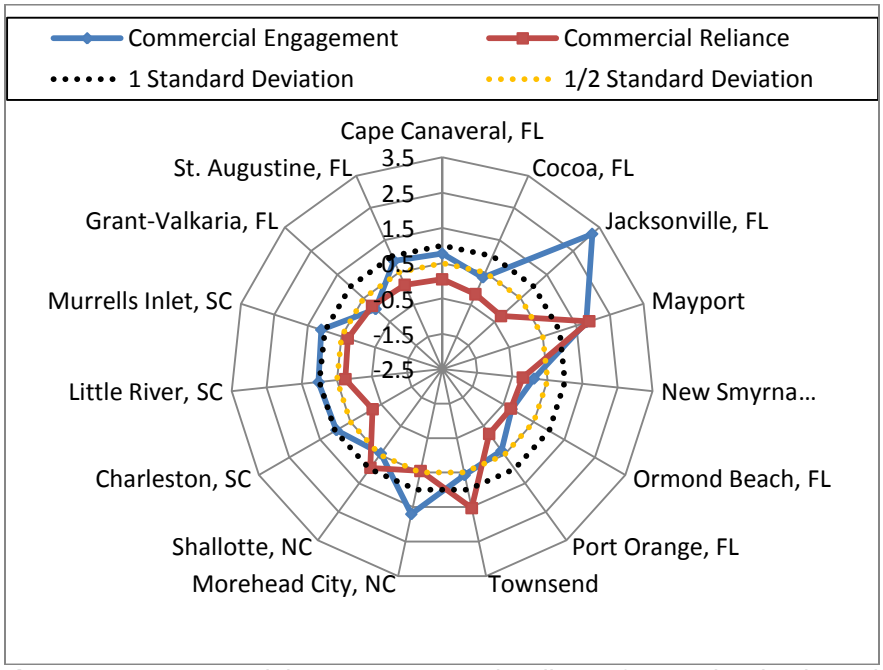

Figure 3-4. Commercial Engagement and Reliance for South Atlantic Red Snapper Communities

Although the fifteen communities selected above in **Figure 3-3** are those with the most commercial landings, because we have few data that allows us to demonstrate where most red snapper recreational landings occur, we are assuming that the would likely be the same communities where the most commercial landings are. By plotting the recreational engagement and reliance factor scores in **Figure 3-5** it becomes evident that eight communities show tendancies toward being engaged in recreational fisheries with three being reliant. The communities of Cape Canaveral, FL; Jacksonville, FL; Port Orange, FL; Morehead City, NC; Charleston, SC; Little River, SC; Murrells Inlet, SC; and St. Augustine, FL are all engaged in recreational fishing. The communities of Morehead City, NC; Murrells Inlet, SC and St. Augustine are also reliant.

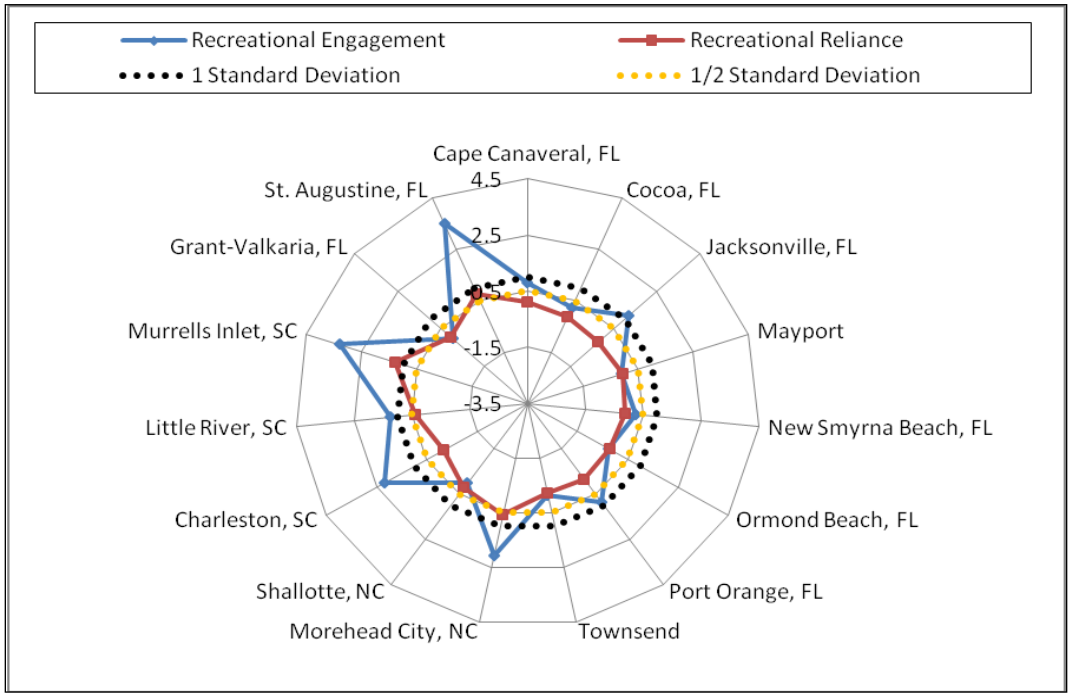

Figure 3-5. Recreational Engagement and Reliance for South Atlantic Red Snapper Communities

Having examined these communities with regard to their engagement and reliance upon commercial and recreational fishing, we would assume that those that are most engaged and reliant on either or both sectors of fishing would be the communities that will see the most impacts from regulatory change. While we infer much of our discussion about social demographic change and other factors affecting the selected communities from previous amendments, recent demographic data has been analyzed and is included in the Environmental Justice discussion below.

Environmental Justice

Executive Order 12898 requires federal agencies conduct their programs, policies, and activities in a manner to ensure individuals or populations are not excluded from participation in, or denied the benefits of, or subjected to discrimination because of their race, color, or national origin. In addition, and specifically with respect to subsistence consumption of fish and wildlife, federal agencies are required to collect, maintain, and analyze information on the consumption patterns of populations who principally rely on fish and/or wildlife for subsistence. This executive order is generally referred to as environmental justice (EJ).

Information on the communities selected above was examined to identify the potential for EJ concern. Specifically, the rates of minority populations and the percentage of the population below the poverty line. The threshold for comparison is 1.2 times the state average such that, if the value for a community was greater than or equal to 1.2 times the state average, then the community was considered an area of potential EJ concern.

Using demographic information from the American Community Survey estimates for 2005-2009 there are no red snapper fishing communities that exceed the thresholds. If a community had exceeded the thresholds, they would be considered vulnerable if regulatory action were to cause some type of social disruption.

Although we have information concerning the community's overall status with regard to minorities and poverty, we do not have such information for fishermen themselves. Therefore we can only place our fishing activity within the community as a proxy for understanding the role minorities and poverty may have on those being affected by regulatory change. While subsistence fishing is also an activity that can be affected by regulatory change, we have no data on this activity at this time. We assume that the effects to other sectors will be similar to those that affect subsistence fishermen who may rely on red snapper. Because red snapper is a reef species, and likely would require a vessel to fish, there may be few if any subsistence fishermen who rely on this species.

3.4 Administrative Environment

3.4.1 The Fishery Management Process and Applicable Laws

3.4.1.1 Federal Fishery Management

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

Responsibility for federal fishery management decision-making is divided between the U.S. Secretary of Commerce (Secretary) and eight regional fishery management councils that represent the expertise and interests of constituent states. Regional councils are responsible for preparing, monitoring, and revising management plans for fisheries needing management within their jurisdiction. The Secretary is responsible for collecting and providing the data necessary for the councils to prepare fishery management plans and for promulgating regulations to implement proposed plans and amendments after ensuring that management measures are consistent with the Magnuson-Stevens Act and with other applicable laws. In most cases, the Secretary has delegated this authority to NOAA Fisheries.

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

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

3.4.1.2 State Fishery Management

The state governments of North Carolina, South Carolina, Georgia, and Florida have the authority to manage fisheries that occur in waters extending three nautical miles from their respective shorelines. North Carolina's marine fisheries are managed by the Marine Fisheries Division of the North Carolina Department of Environment and Natural Resources. The Marine Resources Division of the South Carolina Department of Natural Resources regulates South Carolina's marine fisheries. Georgia's marine fisheries are managed by the Coastal Resources Division of the Department of Natural Resources. The Marine Fisheries Division of the Florida Fish and Wildlife Conservation Commission is responsible for managing Florida's marine fisheries. Each state fishery management agency has a designated seat on the South Atlantic Council. The purpose of state representation at the South Atlantic 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 is also represented at the South Atlantic Council level, but does not have voting authority at the South Atlantic Council level.

NOAA Fisheries' 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.

3.4.1.3 Enforcement

Both the National Oceanic and Atmospheric Administration (NOAA) Fisheries Office for Law Enforcement (NOAA/OLE) and the United States Coast Guard (USCG) have the authority and the responsibility to enforce South Atlantic Council 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 fisheries mission.

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 all but one of the states in the Southeast Region (North 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.

The NOAA Office of General Counsel Penalty Policy and Penalty Schedules can be found at www.gc.noaa.gov/enforce-office 3.html.

Chapter 4. Environmental Consequences and Comparison of Alternatives

4.1 Action 1. Allow Harvest and Possession of Red Snapper in 2012

4.1.1 Biological Effects

No action alternative – Continued closure

The following three documents outline the biological effects of the current red snapper management regime and provide the background for the biological effects of **Alternative 1 (No Action)**:

- Interim rule (NMFS 2009);
- Extension of the interim rule (NMFS 2009);
- Amendment 17A to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP; SAFMC 2010a);
- Emergency rule to delay effective date of snapper grouper closure specified in Amendment 17A to the Snapper Grouper FMP and,
- Regulatory Amendment 10 to the Snapper Grouper FMP (SAFMC 2011a)

The reader should refer to these documents for details on the effects of the current management of red snapper. These documents are available at www.safmc.net. In summary, unsustainable fishing pressure **(Figure 4-1)** prior to the red snapper harvest and possession prohibition (implemented on January 4, 2010), negatively affected the stock as evidenced by a decreased stock biomass **(Figure 4-2)**.

***Alternatives*[1]**
(preferred alternatives in red)

1. No action. ACL=0 (landings), Closed fishery.
2. 2012 ACL.
   - 2a. 2,121 fish (3,379 lbs comm.[2]/1,526 fish rec.)
   - 2b. 8,984 fish (14,313 lbs comm.[2]/6,462 fish rec.)
   - 2c. 13,067 fish (20,818 lbs comm.[2]/9,399 fish rec).
3. 7 day commercial season[3]
4. 6 day recreational season[3]
5. Suspend 20-inch total length (TL) minimum size limit
6. Commercial trip limit
   - 6a. 25 lb gutted weight
   - 6b. 50 lb gutted weight
   - 6c. 75 lb gutted weight
   - 6d. 100 lb gutted weight
7. 1 fish per person per day (recreational)

[1]See Chapter 2 for a more detailed description of the alternatives.
[2]Pounds are in gutted weight.
[3]NOAA Fisheries Service will evaluate landings to determine if the fishery may re-open again in 2012.

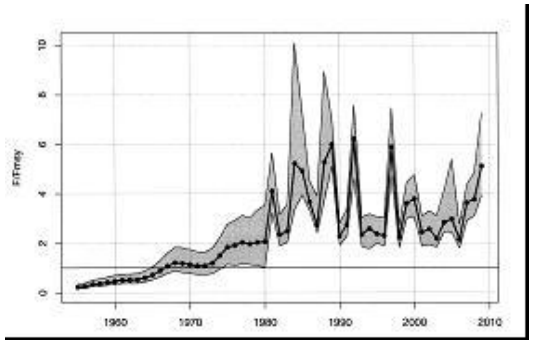

Figure 4-1. The overfishing ratio for red snapper over time. The stock is undergoing overfishing when the F/F_{MSY} is greater than one (SEDAR 24 2010).

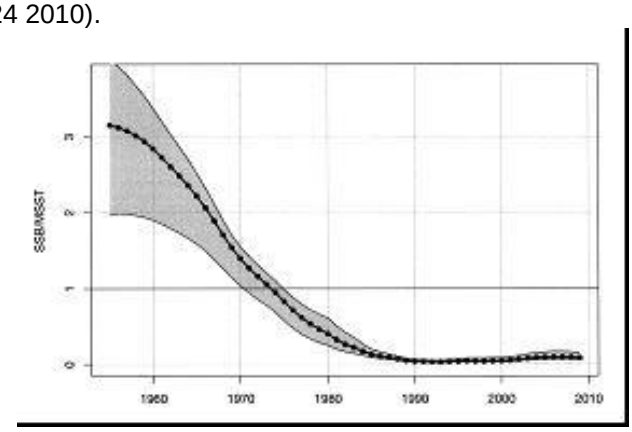

Figure 4-2. The overfished ratio for red snapper over time. The stock is overfished when the SSB/MSST is less than one (SEDAR 24 2010).

In response to the overfishing and overfished stock status of red snapper, fishery managers implemented a harvest and possession prohibition on January 4, 2010. Through Amendment 17A to the Snapper Grouper FMP, fishery managers continued the harvest prohibition of red snapper through the specification of an annual catch limit (ACL) = 0 and implemented a rebuilding plan. The reduction in fishing mortality and establishment of a rebuilding plan is expected to positively affect the stock. The beneficial effects of a rebuilding stock include a return to population characteristics of a more natural state; such population characteristics include the population age and size structure, sex ratio, genetic structure, and biomass. In addition, when the stock is rebuilt, components of the ecosystem (e.g., predator/prey relationship, community structure) would more closely resemble those of an unfished population.

The South Atlantic Fishery Management Council (South Atlantic Council) and NOAA Fisheries have determined that retention of a limited number of red snapper in 2012, along with appropriate management controls, would not jeopardize the rebuilding of the red snapper stock. See **Section 1.4** and **Chapter 5** for further explanation on how fishery managers reached this decision.

Alternatives 2 through 4 – Allowing limited harvest

Alternatives 2 through **4** would allow limited harvest and possession of red snapper in 2012. The allowable harvest levels in **Alternative 2** are consistent with the objectives of the Snapper Grouper FMP, the rebuilding plan from Amendment 17A to the Snapper Grouper FMP and environmental impact statement (SAFMC 2010a), and the ABC recommendation from the South Atlantic Council's

Scientific and Statistical Committee (SSC) and adopted by the South Atlantic Council. The scientific information upon which the ACLs are based in **Alternative 2** (SEDAR 24 and rebuilding projections provided by the Southeast Fisheries Science Center (SEFSC)) has been peer reviewed and the ACLs are based on the best available scientific information.

See **Section 1.6** for an explanation on how the ACLs and Sector-ACLs in **Alternative 2** (and sub-alternatives) were determined.

Preferred Alternative 2c would establish a temporary red snapper ACL of 13,067 fish for 2012, where the commercial ACL would be 3,668 fish or 20,818 lbs gutted weight (gw) and the recreational ACL would be 9,399 fish. The sector ACLs are based on allocations for red snapper (28.07% commercial; 71.93% recreational), which were established in the Comprehensive ACL Amendment (SAFMC 2011b).

Preferred Alternative 3 and **4** would establish a seven-day commercial and six-day recreational season respectively. NOAA Fisheries will evaluate commercial landings to determine if the red snapper ACL is harvested and determine if the commercial fishing season could re-open in 2012. In order to re-open, landings would need to be less than the sector-ACL at the end of the seven day commercial season.

See **Section 1.7** for an explanation on how the season lengths in **Alternatives 3 and 4** were determined.

On a basic level, **Alternatives 2** through **4** would have negligible biological effects to the resource if a portion of the total mortality is transferred from discard mortality to harvest mortality. In other words, red snapper previously killed through the effects of removal from the ocean and returned to the water would now die through retention. Under this scenario, the net loss to red snapper between **Alternative 1 (No action)** and **Alternatives 2** through **4** would be similar. A comparison of biological effects of the sub-alternatives within **Alternative 2** reveal greater adverse effects from increasing ACLs **(Sub-alternative 2a** to **2b** to **Preferred 2c)**; lower ACLs reduce the probability the red snapper commercial component of the snapper-grouper fishery would re-open in 2012, and lower ACLs reduce the chance that overfishing of the stock would occur. Lower ACLs would also increase the probability that the ACL would not be harvested during the initial seven day opening, thus making it less likely that any fish would be left over for a re-opening of commercial harvest.

However, such an analysis may be overly simplistic since fishing effort during the openings may increase if fishermen take trips that would not otherwise be taken, just so they can harvest red snapper. This increased effort may translate into increased mortality. If fishing effort increases, discarding of red snapper and other fish species as outlined in **Section 3.2.5**, may increase if **Alternatives 2** through **4** are implemented, when compared to **Alternative 1 (No action)**. Increased fishing effort may be more likely in the recreational sector (charter boats, headboats, and private recreational sector) than the commercial sector. For-hire fishermen from northern Florida and Georgia have often testified that potential customers have been unwilling to book trips without an opportunity to retain red snapper. Conversely, the establishment of a seven-day season for the commercial sector may not significantly

alter the fishing effort of commercial fishermen. In this regard, the proposed commercial trip limit may become a "bycatch allowance" with few commercial fishermen targeting the red snapper stock. The potential for increased effort was considered by the South Atlantic Council when they reviewed analysis conducted by the Southeast Regional Office (SERO) (SERO-LAPP-2012-04) to determine how long the recreational and commercial fishing seasons could be open to achieve the respective ACLs. The season length recommended by the South Atlantic Council in **Alternatives 3** and **4** represent the lower range of the estimated number of days that would be expected to meet the recreational and commercial ACLs.

Alternative 5 – Minimum size limit removal (commercial and recreational)

Minimum size limits have both beneficial and adverse effects *(see text box)*. Fishery managers in the South Atlantic often implement minimum size limits to increase a fish's opportunity to reproduce before the fish may be legally harvested. It is likely that red snapper encountered during the proposed seasons will have reached the reproductively mature size. In the U.S. South Atlantic and the Gulf of Mexico, Grimes (1987) reported that size of red snapper at first maturity is 9.3 inches (23.7 cm) fork length. For red snapper collected along the Southeastern United States, White and Palmer (2004) found that the smallest mature male was 7.9 inches (20.0 cm) total length (TL). However, minimum size limits may promote the discarding of fish of which a portion may not survive.

Biological impacts of minimum size limits

Beneficial	Adverse
►Decreases mortality rate on younger year class	►Encourages harvest of older, larger fish
►Increases the number of spawning opportunities	►Produces regulatory discards

Alternative 1 (No action) would retain the red snapper 20-inch TL minimum size limit; however, the size limit is not currently applicable due to the prohibition on the harvest and possession of red snapper. Under **Alternative 1 (No action),** if the season were to open, the minimum size limit would be applicable. **Alternative 5 (Preferred)** would temporarily suspend the size limit. Both alternatives could have adverse effects to the stock by promoting the discarding of fish to the water of which a portion would not survive. With a minimum size limit (**Alternative 1/No action)**, fishermen may produce "regulatory discards"; these are fish that are returned to the water because they are below the minimum size limit. These fish may be smaller and younger than a 20-inch TL fish and may have been caught in relatively shallow water. Often, discard mortality rates decrease along with depth that the fish was caught.

Fish returned to the water below the minimum size limit are **Regulatory Discards.**

Fishery managers could produce adverse effects (additional mortality) from both **Alternative 1 (No action)** and **Preferred Alternative 5** through "high-grading" behavior. High-grading is a practice of selectively landing fish so that only the best quality (usually largest) fish are brought ashore. For example, recreational fishermen may discard smaller size fish in order to retain a larger, more desirable red snapper. As release mortality rates for red snapper range from 39 to 48 percent depending on the fishing sector (SEDAR 24 2010), high-grading can result in many dead discards. Fishermen would most likely high-grade less with no size limit (**Preferred Alternative 5**) as fishermen may cease targeting red snapper after harvesting the bag limit. Therefore, suspension of the 20-inch TL minimum size limit (**Preferred Alternative 5**) could have a greater beneficial biological effect than retaining the minimum size limit (**Alternative 1/No action**) if it resulted in fewer fish being discarded.

Returning smaller fish to the water when a larger one is caught is an example of **high-grading behavior.**

Alternative 6 – Commercial trip limits

Alternative 1 (No action) would not implement a trip limit to slow down the rate at which the proposed commercial ACL would be met for red snapper and could translate into adverse biological effects to the stock and snapper grouper fishery. Without a trip limit, the estimated total landings during the proposed seven-day season may exceed the commercial ACL. Based on logbook landings from 2009, the analysis contained in **Appendix C** estimates a season length of 26 days with an ACL of 20,818 lbs gw, no trip limit, and a season start date in September. The season length may be an overestimate if additional trips occur due to the red snapper opening.

Trip limits proposed in **Preferred Alternative 6** would increase the probability that the ACL would not be met during the seven-day season, increase the probability that the commercial season would re-open in 2012, and decrease the direct targeting of red snapper while reducing wasteful dead discards. Higher trip limits would result in more trips directly targeting red snapper as a fisherman's incentive to target a species would be expected to increase as trip limits increase.

The estimated season length, and thus biological effects, would vary depending on the ACL and trip limit combination **(Table 4-1)**. Generally, the smaller the trip limit, the greater the biological beneficial effect to the resource as lower trip limits would reduce the likelihood of an overage of the ACL. Based on the South Atlantic Council's preferred commercial ACL (3,668 fish or 20,818 lbs gw) and trip limit (50 lbs gw), the estimated season length is 68 days. This analysis assumes effort and catch rates of red snapper are comparable to 2009 levels. This analysis is contained as **Appendix C**.

Table 4-1. The estimated commercial season length in days under various commercial ACL (in pounds gutted weight (gw)) and trip limit scenarios if the season opens in September as expected. The analysis is based upon 2009 logbook landings data.

Commercial ACL (lbs gw)	**Trip Limit** (lbs gw)			
	25 (Alt. 6a)	**50** (Alt. 6b) (preferred)	**75** (Alt. 6c)	**100** (Alt. 6d)
3,379 (Alt. 2a)	22 days	11	7	6
14,313 (Alt. 2b)	96	47	31	23
20,818 (Alt. 2c) (preferred)	152	**68**	45	34

Source: SERO-LAPP-2012-04 2012 (Appendix C)

In 2009, 1,997 logbook trips reported landing red snapper. Trips per month ranged from 113-235, or approximately 30-60 per week. During 2009, the maximum amount of pounds landed during a week was 21,423 pounds gutted weight between October 3-9, 2009. This amount was landed by 44 vessels taking 60 trips. Logbook records indicate there were 107 vessels fishing in statistical zones from Central-east Florida (Fort Pierce/Cape Canaveral) through Georgia in 2011 that landed species

commonly associated with red snapper (red snapper was closed in 2011). Commercial fishermen report logbook landings in statistical grids; the grids are approximately 60 by 60 nautical miles each. These species include vermilion snapper, scamp, red porgy, black grouper, gag, red grouper, gray triggerfish, and greater amberjack. If each of these vessels made two trips per week and caught a 50 lb gw trip limit of red snapper, then the projections show that the season would be open 14 days. If the 107 vessels each made three trips per week and caught a 50 lb gw trip limit, then the projections show that the season would be open 9 days. Given that vessels off South Carolina and North Carolina would also be catching some red snapper, it is possible the season could be shorter than the 9 to 14 day range. Based on the analysis outlined above, fishery managers are proposing a seven-day commercial opening for red snapper in a **Preferred Alternative 3**. NOAA Fisheries will evaluate landings to determine the harvest of the ACL and whether additional days can be open in 2012.

Alternative 7 – Recreational bag limit

Bag limits also have desirable characteristics as management tools and are often used in conjunction with size limits to achieve a desired reduction in harvest. They are commonly used management measures, which are readily understood by fishermen, and violations of bag limits are readily apparent by simply counting the number of fish that are retained.

However, there are a number of shortcomings with bag limits similar to the ones previously mentioned concerning size limits. Once the one per person per day bag limit (**Preferred Alternative 7**) is reached, fishermen may retain larger red snapper and throw smaller red snapper back, some of which may be dead. In addition, the snapper grouper fishery represents many species occupying the same location at the same time such as vermilion snapper, scamp, and gag. Fishermen could continue to target these other co-occurring species and throw back fish that have bag limits such as red snapper, many of which will die. It would be expected that fishermen would still tend to target the largest, most desirable species.

Alternative 1 (No action) would not implement a bag limit to slow the rate at which the proposed recreational ACL is being met for red snapper and could translate into adverse biological effects to the stock and snapper-grouper fishery. Without a bag limit, the estimated total landings during the proposed six-day fishing season may exceed the recreational ACL. Conversely, the bag limit proposed in **Preferred Alternative 7** could result in beneficial effects by increasing the probability that the ACL would not be exceeded during the six-day, two weekend season by constraining harvest through effort controls. A bag limit could decrease the incentive to target red snapper; targeting of red snapper may increase discards if high-grading occurs as described previously.

If the recreational season opens in September 2012 as expected, the estimated days available before reaching the preferred recreational ACL of 9,399 fish is 24 days based on mean monthly 2012 landings projected by the Seasonal Autoregressive Integrated Moving Average Model (SARIMA) (**Table 4-2**). The estimated season length would be shortened to 14 days based on 95 percent upper confidence limit of monthly 2012 landings projected by the SARIMA. Assuming 75 percent of a week's recreational landings are landed over the three-day weekend, 2.1-4.8 three-day weekends would be the equivalent of 11 to 25 consecutive days.

SARIMA = **S**easonal **A**utoregressive **I**ntegrated **M**oving **A**verage **M**odel

►Uses historical monthly landings and projected changes in exploitable abundance to predict future monthly landings

Given uncertainties in estimated discard mortalities for 2012, and the potential for large shifts in fishing effort if red snapper are allowed to be harvested, SERO-LAPP-2012-04 2012 (**Appendix C**) recommended that the recreational fishing season be no longer than 2 to 3 consecutive three-day weekends.

Table 4-2. As estimated by SARIMA, the estimated recreational season length in days under each recreational ACL (in numbers of fish) alternatives if the season opens in September as expected.

Recreational ACL (numbers of fish)	Estimated Recreational Season Length (days)	
	SARIMA mean	SARIMA 95% confidence interval
1,526 (Alt. 2a)	4 days	2
6,462 (Alt. 2b)	17	10
9,399 (Alt. 2c) (preferred)	24	14

Source: SERO-LAPP-2012-04 2012 (Appendix C)

Allowing harvest of red snapper during a short time period, as proposed, offers risk due to estimation and observation uncertainty. If an overage of the proposed 2012 ACL (commercial and recreational combined) occurs, fishery managers would not deduct the overage amount from the ACL in the following year because it is not an accountability measure (AM) for red snapper. When the South Atlantic Council established an ACL equal to zero (landed catch) in Amendment 17A to the Snapper Grouper FMP, they did not feel it was reasonable to have an AM that would deduct an overage from the ACL in the following year. Any overage could decrease the probability of rebuilding to target levels within the specified rebuilding timeframe and possibly allow overfishing of the red snapper stock. However, the allowable catch for 2012 is relatively low and the length of the fishing season would be relatively short. Fishery managers are minimizing the probability of an ACL overage through the proposed short openings of the commercial and recreational sectors coupled with effort controls (e.g., bag and trip limits). If a new stock assessment indicates the probability of rebuilding the stock to B_{MSY} by 2046 has been reduced, adjustment to red snapper management measures could be made through a future regulatory or plan amendment. The South Atlantic Council is considering additional management measures for red snapper in Amendment 22 to the Snapper-Grouper FMP. Amendment 22 considers long-term management of red snapper, including the implementation of a tag program where retention is limited to those that possess tags.

Data collection effects

Fishery-independent and fishery-dependent data comprise a significant portion of information used in stock assessments. Fishery independent data for red snapper are being collected by the SEFSC and the Marine Resources Monitoring Assessment and Prediction Program. The prohibition on harvest and possession of red snapper beginning in early 2010 reduced the collection of fishery-dependent data for red snapper. The lack of this information has hindered the ability to assess the stock status of the red snapper population. The next benchmark stock assessment for red snapper has been delayed until 2014, due to data availability. The red snapper opening may have beneficial, indirect effects to the stock by allowing the collection of fishery-dependent data, including information on the age structure of the population and catch per unit effort. The data may provide a better understanding of the composition and magnitude of catch, enhance the quality of data provided for stock assessments, increase the quality of assessment output, and lead to better decisions regarding additional measures that might be needed to rebuild the stock. The data collection process is outlined in **Section 6.5.**

Determination of biological effects cumulatively among all alternatives

In summary, allowing harvest through **Alternatives 2** to **4** is consistent with the following: (1) Assessment results from SEDAR 24; (2) rebuilding projections provided by the SEFSC; (3) ABC recommendation from the South Atlantic Council's SSC and adopted by the Council; and, (4) rebuilding plan implemented in 2010. The assessment and the rebuilding plan have been peer reviewed and are based on the best available scientific information. Overall net biological effects would be neutral if harvest is at or below the ABC.

The estimation of recreational landings would be difficult due to the current survey techniques and the shortness of the season length. However, despite potential increases in effort, conservative management measures are being proposed to prevent overfishing from occurring. Fishery managers and scientists would utilize several methodologies to monitor the mortalities of red snapper during the opening and to estimate if overages of the ACL has occurred. See **Section 6.3** for more information on this topic.

"High-grading" behavior could occur under both **Alternative 1 (No action)** and **Preferred Alternative 5**. **Preferred Alternative 7** could result in beneficial effects by increasing the probability that the ACL would not be exceeded during the six-day, two weekend season by constraining harvest through effort controls. A bag limit could decrease the incentive to target red snapper; targeting of red snapper may increase discards if high-grading occurs as described previously.

4.1.2 Economic Effects

4.1.2.1 Analytical Approach

The procedure for calculating the economic effects of the management alternatives for the commercial sector involves estimating the expected changes in ex-vessel revenues. Although net operating revenue would have been a better metric, the assignment of costs to harvesting red snapper cannot be undertaken with available information. However, it is worth noting that for vessels that would not undertake additional trips during the open season but would be able to keep instead of discard red snapper in their normal trips, revenues derived from selling red snapper would directly add to their net operating revenue. Since the red snapper ban took effect in 2010, more recent ex-vessel price for red snapper is not available. For the current purpose, the average ex-vessel price during 2005-2009 is used but expressed in 2011 price using the consumer price index. Thus, the average ex-vessel price for red snapper is $4.15 per pound in 2011 dollars. The current estimation approach is the same as that used in Amendment 18A (SAFMC 2012a) and Amendment 18B to the Snapper Grouper FMP (SAFMC 2012b), among others.

The procedure for calculating the economic effects for the recreational sector involves estimating the expected changes in consumer surplus (CS) to anglers and net operating revenues (NOR) to for-hire vessels. Consumer surplus is the amount of money that an angler would be willing-to-pay for a fishing trip over and above the cost of the trip. For the current purpose, the CS values used are $76.98 (2011 dollars) per landed fish and, where applicable, $8.39 (2011 dollars) per discarded fish due to the bag limit (Carter and Liese 2012). It is noted that Carter and Liese (2012) also provided estimates, on a declining scale, of additional red snapper landed and additional red snapper caught and released. That is, an additional red snapper kept or additional red snapper caught and released would have lower CS values than those presented above. Net operating revenue is total revenue less operating costs, such as fuel, ice, bait, and other supplies. This procedure follows the method employed in Amendment 17A (SAFMC 2010a) and Regulatory Amendment 10 to the Snapper Grouper FMP (SAFMC 2010b), among others.

CS = Consumer Surplus

►The amount of money that an angler would be willing to pay for a fishing trip over and above the cost of the trip.

The expected changes in ex-vessel revenues for the commercial sector and CS/PS for the recreational sector are calculated relative to **Alternative 1 (No action).** Since the no action alternative prohibits the harvest and sale of red snapper, the economic effects of this amendment would be positive. The measures in this emergency action are currently planned to be in place only for 2012, so the estimated economic effects would only be short-term in nature. Red snapper regulations beyond 2012 are not precisely known. After the measures in this emergency action are no longer in effect, the regulations will revert to what they were before this Emergency Action. Furthermore, the South Atlantic Council is developing Amendment 22 to the Snapper Grouper FMP as there will likely be some other types of regulations in the future depending on new information about the status of the stock. For this reason, the medium- and long-term economic effects of this amendment are difficult to estimate. However, qualitative discussions are added to provide some insights

NOR = Net Operating Revenues

►The total revenue less operating costs, such as fuel, ice, bait, and other supplies.

into the economic effects of this amendment beyond 2012.

4.1.2.2 Economic Effects of Alternative 2

Alternative 2 would establish a temporary red snapper ACL of 2,100 fish (Sub-alternative 2a), 9,000 fish (Sub-alternative 2b), or 13,067 fish (**Preferred Sub-alternative 2c**). This ACL would be allocated between the commercial (28.07%) and recreational sectors (71.93%).

Table 4-3 shows the commercial and recreational ACLs under each sub-alternative and their dollar values in terms of revenues to the commercial sector and CS to the recreational sector. There are general key issues associated with these estimates of economic effects and the 2012 opening of red snapper harvest in general.

Table 4-3. Revenue effects on the commercial sector and CS effects on the recreational sector of the ACL sub-alternatives using a baseline of zero landings for both sectors and zero discards for the recreational sector. Revenues and CS are in 2011 dollars.

Sub-alternatives	Commercial Sector		Recreational Sector	
	ACL (lbs gw)	Revenues (2011$)	ACL (fish)	CS (2011$)
Sub-alt. 2a	3,346	$13,886	1,511	$116,317
Sub-alt. 2b	14,338	$59,503	6,474	$498,369
Preferred Sub-alt. 2c	**20,818**	**$86,395**	**9,399**	**$723,535**

Source: NOAA/NMFS logbook, accumulative landings, and permit files.

***Alternatives*[1]**
(preferred alternatives in red)

1. No action. ACL=0 (landings), Closed fishery.
2. 2012 ACL.
   - 2a. 2,121 fish (3,379 lbs comm.[2]/1,526 fish rec.)
   - 2b. 8,984 fish (14,313 lbs comm.[2]/6,462 fish rec.)
   - 2c. 13,067 fish (20,818 lbs comm.[2]/9,399 fish rec).
3. 7 day commercial season[3]
4. 6 day recreational season[3]
5. Suspend 20-inch total length (TL) minimum size limit
6. Commercial trip limit
   - 6a. 25 lb gutted weight
   - 6b. 50 lb gutted weight
   - 6c. 75 lb gutted weight
   - 6d. 100 lb gutted weight
7. 1 fish per person per day (recreational)

[1]See Chapter 2 for a more detailed description of the alternatives.
[2]Pounds are in gutted weight.
[3]NOAA Fisheries Service will evaluate landings to determine if the fishery may re-open again in 2012.

First, each sector is assumed to fully harvest its allocation under each sub-alternative. Any deviation from fully harvesting a sector's allocation would result in lower or higher revenues or CS. Exceeding its allocation would bring more benefits to the sector in the short term, although there could be negative long-term repercussions. If overages occurred, it would endanger the rebuilding of the stock within the rebuilding time frame. More restrictions could be imposed on the commercial and recreational sectors, in addition to the red snapper closure. In this event, economic benefits derivable from red snapper could be further delayed.

Second, the baseline (no action alternative) catch by each sector is zero. This appears valid for the commercial sector but not necessarily for the recreational sector. In 2010 and 2011 when the red snapper ban was in place, fish mortalities occurred due to the fishing activities of both sectors (**Appendix B**). In the commercial sector, mortalities came only from discards which did not bring in any revenues. In the recreational sector, mortalities came from illegal landings and from discards. Both landings and discards generated CS values for the recreational anglers. During 2010-2011, the

recreational sector landed an average of 1,461 fish and discarded an average of 45,209 fish. Using these figures as the baseline for the recreational sector would decrease the CS values under each sub-alternative. **Table 4-4** shows the same revenues for the commercial sector but lower CS for the recreational sector.

Table 4-4. Revenue effects on the commercial sector and CS effects on the recreational sector of the ACL sub-alternatives, using a baseline of zero landings for the commercial sector and some landings and discards for the recreational sector. Revenues and CS are in 2011 dollars.

Sub-alternatives	Commercial Sector		Recreational Sector	
	ACL (lbs gw)	Revenues (2011$)	ACL (fish)	CS (2011$)
Sub-alt. 2a	3,346	$13,886	1,511	$3,887
Sub-alt. 2b	14,338	$59,503	6,474	$119,069
Preferred Sub-alt. 2c	**20,818**	**$86,395**	**9,399**	**$231,806**

Source: NOAA/NMFS logbook, accumulative landings, and permit files.

Third, the for-hire sector is assumed to not undertake additional trips for targeting red snapper. It is not possible to determine if opening the harvest of red snapper under this Emergency Action would entice additional effort from the for-hire sector. Those usual trips taken by for-hire vessels would add benefits to anglers because they could keep their red snapper bag limit. Increased motivation on the part of anglers to target red snapper and thus increase their demand for for-hire trips would be dampened by some of the measures in this amendment, such as the one-fish bag limit and weekend-only opening. Nevertheless, in the event that for-hire trips actually increased, net operating revenues of for-hire vessels would likely increase and the economic effects to the recreational sector would be greater than those shown in **Table 4-3 or Table 4-4**. However, the likelihood of the recreational sector exceeding its allocation would also be higher, resulting in likely long-term negative repercussions on the sector. Possibilities for effort change among private anglers and some of their implications on for-hire operations are discussed below in connection with the discussion of **Preferred Alternatives 4** and **7**.

Fourth and partly related to the third point above, there is the general issue of whether opening of red snapper harvest in 2012 would lead to effort increases in the red snapper segment in particular and the snapper grouper fishery in general. An increase in the overall effort of the commercial sector appears to be unlikely. In 2010-2011, when red snapper harvest was prohibited, the commercial sector discarded an average of about 118,000 lbs gw, which is significantly greater than the highest commercial ACL in this amendment. Under the 2012 opening of red snapper harvest, some of these discards would be kept and generate extra revenues to the vessels. There is always the possibility that some vessels may increase their target effort for red snapper, but measures in this amendment, such as the trip limit and 7-day open season, in addition to the relatively low ACL, would constrain such effort increases.

The case with the recreational sector with respect to effort increase is not quite as clear as with the commercial sector. Recreational effort could remain the same if anglers take trips as usual but this time keep their bag limit for red snapper or if existing effort is merely redirected to the open season for red snapper. Another possibility is for red snapper directed effort to increase as more people target red snapper. This could have implications not only in the catch of red snapper but also of other species caught in the same trip, affecting the level of economic benefits derivable from all such species.

Noting the foregoing discussions, the preferred alternative (**Preferred Sub-alternative 2c**) may be expected to result in approximately $86,000 (2011 dollars) revenue increase for the commercial sector and CS increases to the recreational sector of approximately $232,000 (2011 dollars) to $724,000 (2011 dollars). Among the sub-alternatives, this would provide the biggest revenue increase to the commercial sector and CS increase to the recreational sector.

4.1.2.3 Economic Effects of Preferred Alternative 3

Preferred Alternative 3 would establish a 7-day open season for the commercial sector in 2012, with NOAA Fisheries evaluating the data to determine if any additional days to harvest red snapper can be open in 2012 if not all of the commercial sector's ACL was not harvested in the seven day season. The various potential lengths of the red snapper commercial season are discussed in **Appendix D**. The commercial fishing season is estimated to last 68 days, assuming the 2012 season would start in September and the South Atlantic Council's preferred options for ACL (20,818 lbs gw) and trip limit (50 lbs gw). This would be about ten 7-day seasons. While 68 days was the initial estimated length of the commercial fishing season, it was reduced to 7 days for all the reasons discussed in Section 1.7.

Assuming no overages, the revenues shown above (**Table 4-3** or **Table 4-4**) would be the maximum revenues the commercial sector could generate in 2012. It may be recalled that the price per pound used in deriving those revenues was based on inflation-adjusted prices in 2005-2009 when the red snapper season was open year round. There are two contrasting possibilities here for a different price level. Because of the red snapper closure in the South Atlantic, it is possible for the price of red snapper to be relatively high. Red snapper landings, once harvest and sale are allowed, would then result in higher revenues than shown in **Table 4-3 or Table 4-4**. It appears, though, that the likelihood of red snapper price to be high may be low because of the presence of substitutes in the form of domestic landings of other snapper grouper and imports. The other possibility is for red snapper price to be lower, once harvest and sale of the species are allowed. A 68-day season would generally be expected to increase the motivation of fishermen to fish as fast as they can before the season ends. The prospect of a shorter season, especially under a 7-day initial opening, would only heighten such motivation. This could possibly result in most of the ACL being taken earlier than 68 days, potentially dampening prices fishermen would receive for their catch. If it were to happen, the commercial sector would receive lower revenues than shown in **Table 4-3 or Table 4-4**.

While a 7-day initial opening may be perceived as the start of mini-derbies (if more than one 7-day season occurs) that would tend to reduce the commercial sector revenues below the maximum estimated above, it would help to lessen the likelihood that overages would occur. In this sense, the long-term effects of this alternative would be positive.

4.1.2.4 Economic Effects of Preferred Alternative 4

Preferred Alternative 4 would establish a two weekend-only (Friday, Saturday, Sunday) opening for the recreational sector. As with the commercial sector, the various potential lengths of the red snapper recreational season are discussed in **Appendix B**. The recreational fishing season is estimated

to last 14 or 24 days, assuming a September season start and an ACL of 9,399 fish. This would be about five or eight weekend-only seasons. While 14-24 days was the initial estimated length of the recreational fishing season, it was reduced to two 3-day weekends for all the reasons discussed in Section 1.7.

In general, if this fishing season structure for the recreational sector resulted in the sector fully harvesting its ACL, the likely CS increase would be those shown in **Table 4-3** or **Table 4-4**. If there are differences in valuing fishing trips and fish between weekend and weekday anglers, the resulting CS values could differ from those shown in those two tables. At present, information on such CS difference is not available.

Preferred Alternative 4 would naturally favor those anglers taking weekend trips and for-hire vessels specializing on weekend trips. If for-hire booking for the remainder of 2012 has already been done, this alternative would favor weekend bookings. For-hire vessels so favored could generate higher net operating revenues especially if more anglers choose to target red snapper. In addition, only anglers on weekend trips would get all the kept fish (not caught and discarded fish) CS increases from opening the red snapper season in 2012. It is noted that both weekend and weekday anglers who caught and discarded red snapper would also derive some consumer surplus albeit at a much lower level. The possibility exists that some anglers would shift their trips to weekends to be able to catch and keep red snapper. Whether this would increase overall target effort for red snapper cannot be ascertained with available information.

Preferred Alternative 4 could assist in ensuring the recreational ACL is not exceeded. In this sense, the long-term economic implications of this alternative would be positive.

CS = Consumer Surplus

►The amount of money that an angler would be willing to pay for a fishing trip over and above the cost of the trip.

4.1.2.5 Economic Effects of Preferred Alternative 5

Preferred Alternative 5 would suspend the commercial and recreational size limit for red snapper during the temporary open season. This alternative has two contrasting possibilities in affecting the fishing cost of commercial vessels. Cost could decrease since commercial vessels would not be compelled to fish longer to catch legal-sized fish and would not have to spend time culling fish to separate the legal-sized fish. On the other hand, commercial vessels targeting red snapper could easily meet their trip limit (**Alternative 6**), and thus would be motivated to undertake many shorter trips. If this action promotes a derby-style behavior, fishing cost for the entire industry could increase as many more vessels will undertake many shorter trips before the season closes. This possibility could lead to the commercial sector exceeding its ACL, although the 7-day season (**Alternative 3**) could put some constraints on overages. One upside to shorter trips, however, is the lower likelihood of discards, although a fishing closure would not eliminate discards, as was the case in 2010 and 2011.

Preferred Alternative 5 would allow recreational anglers to keep whatever size fish they catch, and since CS is higher for kept fish than for discarded fish, anglers who catch and keep red snapper could experience higher CS per trip. Nevertheless, an increase in CS would still be constrained by the presence of the sector's ACL. High-grading of fish could still occur in the recreational sector,

especially under a 1-fish bag limit per person per day (**Preferred Alternative 7**). This issue is explored further in connection with the discussion of the economic effects of **Preferred Alternative 7**.

4.1.2.6 Economic Effects of Alternative 6

Alternative 6 would establish a commercial trip limit of 25 lbs gw (Sub-alternative 6a), 50 lbs gw (**Preferred Sub-alternative 6b**), 75 lbs gw (Sub-alternative 6c), or 100 lbs gw (Sub-alternative 6d) for 2012. **Table 4-5** shows the revenue per trip for each trip limit option and average revenues per trip affected by the trip limit options. All revenues are in 2011 dollars.

Data from the 2009 commercial fishing season are used to determine the economic implications of the various trip limit options. In 2009, trips that landed red snapper had average revenue of $658 from red snapper and an average revenue of $3,105 from all species caught in the trip. On average then, revenues from red snapper comprised 21% of total revenues from the trip. The highest revenue from red snapper for a trip was about $ 18,770, and the total revenue associated with this trip was $20,892. For this particular trip, red revenue accounted for about 90% of total trip revenue. The lowest red snapper revenue for a trip was about $8 and total revenue for this trip was about $319, or red snapper revenue was about 3% of total revenue for the trip.

In **Table 4-5**, red snapper revenue per trip is derived as the trip limit in pounds gw multiplied by the average ex-vessel price. This number should be distinguished from average revenue per trip from the sale of red snapper in 2009 when there was no red snapper trip limit. Consider, for example, Sub-alternative 6a in Table 4-5. Red snapper revenue per trip under the trip limit is equal to $104 while average revenue per trip from red snapper without the trip limit is $1,039. Based on 2009 commercial fishing season, **Preferred Sub-alternative 6b** would imply that there are 948 trips with an average revenue from red snapper that is equal to or greater than the red snapper revenue per trip of $218 under the trip limit. These trips have an average revenue of $1,304 from red snapper and average total revenue of $4,050 from all species caught in the trip. This sub-alternative would also imply that there are 1,049 trips with average revenue from red snapper that are below the red snapper revenue per trip of $218 under the trip limit. These trips have an average revenue of $76 from red snapper and an average total revenue of $2,253 from all species caught in the trip. Red snapper revenue comprised 3% of total trip revenue. Numbers for the other sub-alternatives have similar interpretation.

As discussed above (see discussion for **Alternative 2**), total commercial effort may not increase, but some vessels may increase their trips to target red snapper. For a given red snapper trip limit, those trips below the red snapper revenue per trip may not be taken to specifically target for red snapper. They may still occur and catch red snapper, with vessels generating additional revenue from red snapper. In the case of the preferred trip limit (**Preferred Sub-alternative 6b**), for example, 1,049 trips would unlikely be taken to specifically target red snapper. Some or all of them may still occur and generate additional revenue this time. On the other hand, some of those trips that caught more than a given trip limit may be taken to target red snapper. In the particular case of the preferred trip limit (**Preferred Sub-alternative 6b**), some of those 948 trips would be taken to specifically target red snapper. That only some of these trips may target red snapper may be partly inferred from the fact that the average red snapper revenue ($1,304) is substantially larger than the red snapper revenue per trip of $218 under the trip limit.

While, on average, red snapper revenue accounted for 28% to 39% of total revenue from a trip, there were actually some trips in 2009 that depended more heavily on red snapper as a source of revenue. Although not shown in the table, commercial data for 2009 indicate that 437 trips out of 1,997 trips

depended on red snapper for more than 50% of their total trip revenues. These are the most likely trips to be directed at harvesting red snapper during the open season.

Preferred Alternative 6 would help in ensuring the commercial ACL is not exceeded. Overages could require more stringent regulations, in addition to red snapper fishing closure, on commercial vessels harvesting snapper grouper. In this sense, the long-term economic effects of this alternative may be considered positive.

Table 4-5. Red snapper revenue per trip and average revenue for trips affected by the trip limit options based on 2009 commercial fishing season. Revenues are in 2011 dollars.

Sub-Alt.	Red Snap. Rev. Per Trip	Equal or Greater Than Red Snapper Revenue per Trip				Less Than Red Snapper Revenue per Trip			
		Trips	Red Snapper Revenue	Total Trip Revenue	% To Total	Trips	Red Snapper Revenue	Total Trip Revenue	% To Total
6a	$104	1228	$1,039	$3,685	28	769	$49	$2,180	2
Preferred 6b	**$218**	**948**	**$1,304**	**$4,050**	**32**	**1049**	**$76**	**$2,253**	**3**
6c	$311	784	$1,521	$4,274	36	1213	$100	$2,350	4
6d	$415	657	$1,746	$4,506	39	1340	$125	$2,419	5

Source: NOAA/NMFS logbook, accumulative landings, and permit files.

4.1.2.7 Economic Effects of Preferred Alternative 7

Preferred Alternative 7 would establish a recreational bag limit of 1 fish per person per day for 2012. In this document, a CS value of $76.98 (2011 dollars) is assigned to the first red snapper harvested and kept by an angler. An additional red snapper kept, say on a two-day trip, would have a lower value. Red snapper in excess of the bag limit would have to be released, and in this document the first caught and released red snapper is assigned a CS of $8.39 (2011 dollars). Additional red snapper caught and released would have lower values. Thus, a trip that caught two red snapper, one kept and the other released, would generate for the angler a total CS of $85.37 from red snapper. This is the sum of the CS value of $76.98 from keeping the fish and the CS value of $8.39 from catching and releasing the fish. It is noted that this is a net value which already accounts for fishing costs. In addition, other species kept or released in the same trip would also generate kept and released CS for the angler.

Preferred Alternative 7, in combination with **Preferred Alternative 4**, would tend to favor those catching one red snapper on weekends. As noted earlier, though, those catching more than one red snapper on a trip would still benefit from their released fish, although that benefit would be lower. It is likely that private mode anglers would be the dominant participants with the opening of the recreational red snapper season in 2012. In 2009, for example, private mode anglers accounted for over 90% of all target trips for red snapper.

Preferred Alternative 7, in combination with **Preferred Alternative 5,** could promote highgrading, given the usual understanding that a bigger red snapper is associated with a higher CS. To provide some sort of assurance the trip is "successful", at least one red snapper would be kept by the angler. The first fish caught would be kept to hedge against not catching any more red snapper, but fishing would not

necessarily cease right away. Any other red snapper caught would be either released if it is smaller or kept if it is bigger with the first kept fish being released. This would continue for the duration of the trip, noting especially that other species could be targeted or caught in the same trip. The more fish are caught, the higher is the probability of keeping a bigger fish, resulting in higher CS to the angler. In addition, overall CS would be higher when more fish are caught and released because anglers can derive additional CS from these fish.

Under **Preferred Alternative 4** (2 3-day weekend only openings), the recreational season could potentially span two waves (Wave 5; September-October) and (Wave 6; November-December) of the regular recreational season if one of the 3-day fishing seasons occurred during Wave 5, and the second 3-day fishing season was delayed to Wave 6 due to poor weather. During 2005-2009, target trips (i.e., trips in which the anglers expressed their target species) for red snapper averaged 5,993 in Wave 5 and 6,687 in Wave 6, or a total of 12,679 trips for the two waves. Catch trips (i.e., trips that caught red snapper whether or not anglers targeted the species) as expected were higher at 12,025 in Wave 5 and 11,290 in Wave 6, or a total of 23,315 trips for the two waves. Under **Preferred Alternative 7**, the maximum number of trips that can keep red snapper would theoretically be equal to the recreational ACL of 9,399, which is the preferred ACL alternative. It appears then that there is enough historical target and catch trips for these two waves to harvest the entire recreational ACL. In the event, however, that target effort for red snapper increases above historical levels during the open season, such increase would likely be redirected effort from the other waves.

This alternative would assist in keeping the recreational sector from exceeding its ACL, and this is important because of the difficulty of monitoring recreational harvest on a real time basis. Thus, the long-term economic implications of this alternative would be positive.

4.1.3 Social Effects

The decision to allow for the harvest of red snapper in South Atlantic waters is likely to have some positive social effects, as the closure of this fishery was highly controversial. Public comment suggested that there were more red snapper than that reflected by the stock assessment science. Although the stock assessment remains the same, with reduced mortalities occurring, the possibility of a partial open season for red snapper should have positive attitudinal effects if not more lasting impacts through alternatives that provide positive social changes with regard to fishing behavior and the anticipated socioeconomic benefits described below. **Alternative 1 (No Action)** would keep current regulations, which do not allow any harvest, in place and although this may likely have beneficial effects biologically, it may have negative social effects as the public might see the lack of any action as a sign that the South Atlantic Council or NOAA Fisheries does not sincerely consider public comment. Much of the public comment suggested that there could be negative social and economic impacts from the closure.

***Alternatives*[1]**
(preferred alternatives in red)

1. No action. ACL=0 (landings), Closed fishery.
2. 2012 ACL.
   - 2a. 2,121 fish (3,379 lbs comm.[2]/1,526 fish rec.)
   - 2b. 8,984 fish (14,313 lbs comm.[2]/6,462 fish rec.)
   - 2c. 13,067 fish (20,818 lbs comm.[2]/9,399 fish rec).
3. 7 day commercial season[3]
4. 6 day recreational season[3]
5. Suspend 20-inch total length (TL) minimum size limit
6. Commercial trip limit
   - 6a. 25 lb gutted weight
   - 6b. 50 lb gutted weight
   - 6c. 75 lb gutted weight
   - 6d. 100 lb gutted weight
7. 1 fish per person per day (recreational)

[1]See Chapter 2 for a more detailed description of the alternatives.
[2]Pounds are in gutted weight.
[3]NOAA Fisheries Service will evaluate landings to determine if the fishery may re-open again in 2012.

By allowing a partial season for red snapper in **Alternative 2**, some of those concerns about the negative effects of the closure might be alleviated. Although it is difficult to determine how fishing behavior will change, the various **Sub-alternatives 2a-2c** offer a graduated increase in the allowable ACL for red snapper from 2,121 fish to 13,067 respectively, which should be positive. Certainly, the **Preferred Sub-alternative 2c** would have the greatest positive social effects by allowing for the largest temporary ACL. The increased fishing opportunities might allow for increased commerce for charter fishermen and associated businesses. Commercial fishermen may be able to keep more red snapper that might have been discarded otherwise and also see an economic benefit. So, there should be an overall positive social effect. However, there may also be negative social effects associated with this type of opening. The initiation of derby fishing where many vessels are pursuing red snapper at the same time could become a factor. This can place vessels in direct competition or force some to fish in weather that is dangerous. These concerns may be addressed by other alternatives described below.

Establishing a seven day opening for the commercial sector to be evaluated as an accountability measure under **Preferred Alternative 3** is likely to have few social effects other than to ensure that the ACL is not exceeded, which should be positive. The same is true for the recreational sector under **Preferred Alternative 4** that is a similar accountability measure for that sector. Under **Preferred**

Alternative 3, if the ACL has not been met, the opening can be extended which should have positive social effects by extending any economic and or social benefits. Therefore, it is incumbent upon NOAA Fisheries to ensure measures are in place to account for harvest by both sectors in a timely manner.

The suspension of the minimum size limit under **Preferred Alternative 5** should also have positive social effects as it removes the tendency for regulatory discards to occur. This allows fishermen to keep fish that they would otherwise have to discard if under the size limit. However, there is still a chance that fishermen will high-grade (discard smaller fish for a larger one) if possible. Nevertheless, the fewer opportunities for regulatory discards is a positive social effect by allowing fishermen to keep fish that might die even if not kept, as reef fish often do not survive the ascent to the surface which could increase mortalities.

By establishing a commercial trip limit under **Alternative 6** some effects of the derby fishing can be curtailed thereby possibly extending the commercial opening which would be a positive social effect. With the increasing trip limit from 25 lbs gw to 100 lbs gw in **Sub-alternative 6a to Sub-alternative 6d**, respectively, it is unclear as to how fishing behaviors might change. With larger trip limits, i.e. **Sub-alternative 6d**, red snapper are more likely to be targeted, whereas under **Sub-alternative 6a**, fishermen may use the opening to land more red snapper as bycatch rather than a target fish. With a larger trip limit the commercial sector might close earlier which can have both positive and negative effects. The positives come primarily from the glut of red snapper that may be on the market and often bring prices down, so, consumers see a benefit. However, fishermen can see a negative effect as prices can be reduced such that trip revenues are affected.

The establishment of a one fish bag limit with **Preferred Alternative 7** would have a similar effect as **Alternative 6** above for recreational fishermen by extending their season. Without a bag limit, a derby fishery could develop within the recreational sector that could substantially shorten the open season. Therefore, the one fish bag limit should have positive social effects by extending the season and whatever social and economic benefits occur as a result.

4.1.4 Administrative Effects

Administrative impacts associated with this action are primarily associated with data monitoring, outreach and enforcement. Selection of any of the action alternatives would increase the administrative impacts from the status quo. Selection of multiple alternatives would increase the administrative impacts as well.

Alternative 2 and associated sub-alternatives would establish a temporary ACL for red snapper for 2012. Although the sub-alternatives would specify various ACLs depending on which sub-alternative is chosen, the administrative impacts associated with any of the sub-alternatives would not differ much. Establishing an ACL in 2012 would require extensive outreach to explain the mechanics of the temporary ACL and monitoring. All of the alternatives in this action would increase the administrative impacts on the agency.

Preferred Alternative 3 and **Preferred Alternative 4** would result in the greatest administrative impacts. The red snapper component of the snapper grouper fishery is currently closed and has been since 2010. The proposed seven day commercial openings and multiple weekend only recreational seasons would involve rule-making, real time data monitoring, outreach and enforcement. Rule-making would result in a minor administrative burden. Most of the administrative burden would be associated with data monitoring, enforcement, and outreach.

Preferred Alternative 5 would eliminate the commercial and recreational size limit thereby reducing the administrative impacts. Administrative impacts would be associated with outreach.

Alternatives[1]
(preferred alternatives in red)

1. No action. ACL=0 (landings), Closed fishery.
2. 2012 ACL.
   - 2a. 2,121 fish (3,379 lbs comm.[2]/1,526 fish rec.)
   - 2b. 8,984 fish (14,313 lbs comm.[2]/6,462 fish rec.)
   - 2c. 13,067 fish (20,818 lbs comm.[2]/9,399 fish rec).
3. 7 day commercial season[3]
4. 6 day recreational season[3]
5. Suspend 20-inch total length (TL) minimum size limit
6. Commercial trip limit
   - 6a. 25 lb gutted weight
   - 6b. 50 lb gutted weight
   - 6c. 75 lb gutted weight
   - 6d. 100 lb gutted weight
7. 1 fish per person per day (recreational)

[1]See Chapter 2 for a more detailed description of the alternatives.
[2]Pounds are in gutted weight.
[3]NOAA Fisheries Service will evaluate landings to determine if the fishery may re-open again in 2012.

Alternative 6 and associated sub-alternatives would establish a trip limit of varying weights during the period of temporary ACL in 2012. Establishing the temporary ACL for 2012 would result in increased enforcement needs and outreach. Regardless of which sub-alternatives are selected, the administrative impacts would be similar.

Outreach and Education

The announcement of the temporary ACL and fishery openings would be published in the *Federal Register* as a temporary rule and will be communicated to interested parties via Fishery Bulletin, website updates, Twitter and NOAA Weather Radio updates. There is the potential that under **Alternatives 3 and 4 (Preferreds)** that the openings would need to be modified due to bad weather events. Fishery managers would use all tools available to reach out to constituents in those circumstances including the use of NOAA Weather Radio, Twitter, Facebook, and webpage updates.

Data Monitoring

Commercial landings would be monitored with the SEFSC Commercial Monitoring System. This quota monitoring system is based on dealer reports and is being used for all species with commercial ACLs. MRIP and the headboat survey would be used to monitor recreational landings. The states have stated that extra dockside samplers would be made available to collect biological data on landed fish. There could be additional measures to count vessels as they leave ports to try to quantify effort.

Chapter 5. Reasoning for Council's Choice of Preferred Alternatives

5.1 Action 1. Allow Harvest and Possession of Red Snapper in 2012

In anticipation of holding discussions during their June 2012 meeting to consider a limited re-opening of the red snapper fishery, the South Atlantic Fishery Management Council (South Atlantic Council) requested dead discard estimates from the Southeast Fisheries Science Center (SEFSC) for 2010 and 2011. In a letter dated April 7, 2012, the South Atlantic Council asked for red snapper discard mortality estimates (all sectors) to compare to the previously projected mortality levels from the latest stock assessment (SEDAR 24) and thus determine whether any harvest could be allowed in 2012. The SEFSC subsequently provided the information in **Appendix B**. After accounting for the 2012 discard mortalities, the South Atlantic Council determined that directed harvest could be allowed without compromising the rebuilding of the stock to target levels. Therefore, in a letter dated June 19, 2012, the South Atlantic Council requested that NOAA Fisheries allow harvest and possession of red snapper in 2012 through emergency regulations. NOAA Fisheries prepared this environmental assessment to address the South Atlantic Council's request.

At the June 11-15, 2012, South Atlantic Council meeting, staff from the Southeast Regional Office (SERO) presented options for different levels of possible harvest (based on different assumptions and mathematical methods) and approaches for allowing red snapper harvest to take place in 2012 (**Appendix C**). The South Atlantic Council chose to set the 2012 annual catch limit (ACL) for red snapper at 13,067 fish (**Preferred Sub-alternative 2c**) because this option was at neither extreme of the range of options presented in the SERO analysis and because Council members concluded it was a reasonable level of allowable harvest given the high level of uncertainty in selecting an ACL for the current year with the information available. On the other hand, the South Atlantic Council also reasoned that low levels of harvest (as those under **Sub-alternatives 2a and 2b**) would not provide enough socio-economic benefits to warrant a request for emergency action. The South Atlantic Council also opted to apply the current sector allocations (established through the Comprehensive ACL Amendment) of 28.07% commercial and 71.93% recreational to the ACL to calculate sector ACLs (recreational ACL = 9,399 fish; commercial ACL = 3,668 fish or 20,818 lbs gutted weight (gw)). See Section 1.6 for an explanation on how the ACLs were calculated.

The South Atlantic Council then discussed the manner in which a re-opening could be implemented. For the commercial sector, the South Atlantic Council opted for a 7-day mini-season (**Preferred Alternative 3**), with the possibility for additional openings in 2012 based on an evaluation of the landings at the conclusion of the 7-day period. Initially a 5-day season was proposed but it was noted that many commercial vessels customarily make 7-day trips and those vessels would have to modify their schedules to remain within a 5-day red snapper commercial opening. Also, opening commercial harvest in short intervals would allow the necessary time to evaluate landings relative to the commercial ACL. The South Atlantic Council chose to manage recreational harvest with two three-day (Friday-Sunday) openings in 2012 (**Preferred Alternative 4**). According to the SERO analysis (**Appendix C**), recreational season

lengths ranged from 11 to 25 consecutive days (based on the Council's preferred recreational ACL of 9,399 fish). The analysis suggested that the recreational fishing season should be no longer than 2-3 consecutive three-day weekends given the uncertainties in estimated discard mortalities for 2012 and the potential for large shifts in fishing effort.

The South Atlantic Council discussed possible size limit, bag limit, and trip limit specifications. To minimize regulatory discards, the South Atlantic Council chose **Preferred Alternative 5,** which would suspend the 20-inch size limit currently specified for red snapper for both commercial and recreational sectors. The South Atlantic Council expressed concerns over the possibility of high-grading, but determined that implementing mandatory retention would present enforcement difficulties. The South Atlantic Council chose **Preferred Alternative 7** as the red snapper recreational bag limit. A one fish per person per day (consistent with limits for other snapper grouper species such as snowy grouper, golden tilefish and wreckfish) was deemed the most appropriate. Finally, to allow for a controlled commercial harvest, the South Atlantic Council chose **Preferred Sub-alternative 6b**, which would establish a 50 lb gw commercial trip limit. The analysis in **Appendix C** suggests that, if the same number of vessels fishing off Central-east Florida through Georgia in 2011 that landed species commonly associated with red snapper made two trips per week and caught a 50 lb gw trip limit of red snapper, then the season would be open 14 days. If these vessels each made three trips per week and caught a 50 lb gw trip limit, then the season would be open 9 days. Hence a 50 lb gw trip limit was deemed the most appropriate to ensure the commercial red snapper ACL would be harvested while minimizing the chance of an overage.

One of the main factors the South Atlantic Council considered in discussing re-opening of red snapper harvest was the opportunity for data collection. Representatives from the SERO and the SEFSC indicated that data monitoring and acquisition during the re-opening would be critically important and would require cooperation among state and federal agencies, as well as additional resources, to obtain biological samples and conduct dockside intercepts. Accounting for recreational effort would be the most challenging. Staff from the SEFSC expressed their intention to communicate with Marine Recreational Information Program (MRIP) staff to determine how MRIP could provide additional resources to estimate effort, allow an enhanced sampling level on the docks to do the dockside intercepts, and how the proposed approach to allow harvest of red snapper would fit in with established MRIP estimation process. Moreover, the SEFSC representative stated that a critical component would be to collaborate with the states to get observers on headboats and, if possible, on charter vessels, to gather concrete data on discards.

Because the South Atlantic Council requested that actions to open the red snapper component of the snapper grouper fishery be implemented via Emergency Rule, there was no time to seek input from Advisory Panels. However, the chairman of the Snapper Grouper Advisory Panel, representatives of the Scientific and Statistical Committee and the Law Enforcement Advisory Panel participated in discussions during the South Atlantic Council's June 2012 meeting. In addition, the South Atlantic Council held a public comment session prior to approving any motions pertaining to the management of red snapper. The majority of stakeholders were in favor of a limited re-opening of red snapper harvest in 2012.

The Council concluded that **Preferred Alternatives and Sub-alternatives 2c, 3, 4, 5, 6b** and **7** best meet the purpose and need to allow harvest of red snapper in the South Atlantic in 2012 and reduce existing socio-economic adverse impacts to fishermen and fishing communities, while keeping mortality levels below the levels allowed in the rebuilding plan. The preferred alternatives also best meet the

objectives of the Snapper Grouper Fishery Management Plan, as amended, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

Chapter 6. Additional Information Including Opening and Closing Information and Data Collection Procedures

6.1 Justification for Emergency Action

At its June 2012 meeting, the South Atlantic Fishery Management Council (South Atlantic Council) requested that NOAA Fisheries promulgate emergency regulations to allow for the limited harvest and possession of red snapper in 2012. The South Atlantic Council voted to implement commercial and recreational management measures to ensure that only a limited amount of red snapper would be harvested and possessed and that this allowance would not prohibit the stock from rebuilding to target levels within the specified timeframe. The NOAA Fisheries' Policy Guidelines for the Use of Emergency Rules (62 FR 44421, August 21, 1997) list three criteria for determining whether an emergency exists, and the temporary rule is promulgated under these criteria. Specifically, the policy guidelines require that an emergency exists under the following conditions: (1) Result from recent, unforeseen events or recently discovered circumstances; (2) Present serious conservation or management problems in the fishery; and, (3) Can be addressed through emergency regulations for which the immediate benefits outweigh the value of advance notice, public comment, and deliberative consideration of the impacts on participants to the same extent as would be expected under the normal rulemaking process.

Discard estimates from commercial logbooks, Marine Recreational Fisheries Statistical Survey (MRFSS), and the Southeast Headboat Survey recently became available to the South Atlantic Council and NOAA Fisheries and constitute recently discovered circumstances. The acceptable biological catch (ABC) from a red snapper rebuilding projection in 2012 is 86,000 fish (SEDAR-24 Projection Run 9c). Discards are projected to increase while the stock rebuilds; however, fishing effort for red snapper has declined during the harvest prohibition, which may reduce discards. Red snapper harvest can only be allowed if projected mortalities from harvest and release of fish are less than ABC for that year. Using the average of 2010 and 2011 estimated mortalities and 2012 ABC, NOAA Fisheries estimates there will be 72,933 red snapper killed in 2012 (**Preferred Sub-alternative 2c**) from incidental catch of red snapper. The ABC for 2012 from SEDAR 24 (2010) is 86,000 fish, therefore, the ABC is higher than discard mortalities for 2012. As a result, the South Atlantic Council and NOAA Fisheries determined 13,067 red snapper may be harvested in or from the South Atlantic in 2012.

A new stock assessment for red snapper has been delayed due to data availability. Actions have been taken to end overfishing and harvest has been prohibited since January 2010. Rebuilding projections from the 2010 stock assessment provide an estimate of available red snapper harvest each year. Waiting for a new assessment before any harvest of red snapper could occur would cause an unnecessary negative economic and social effect of fishermen and associated industries. A limited commercial and recreational season for red snapper in 2012 would provide fishery-dependent data needed for the 2014 red snapper stock assessment. These data would help evaluate the current state of the stock and determine whether fishing can open for longer periods of time in the future. A limited 2012 red snapper season would also

reduce socio-economic impacts on South Atlantic snapper-grouper fishermen by allowing a highly marketable fish to be harvested, which can boost their income.

Input from the public and from a number of communities indicates the harvest prohibition for red snapper has caused economic harm to individuals and associated communities. Unnecessarily prolonging the harvest prohibition presents serious conservation and management problems in the snapper grouper fishery. The immediate benefits of implementing a limited commercial and recreational fishing season for red snapper in 2012 outweigh the value of advance notice and public comment. In consideration of National Standard 10 of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), a limited red snapper season must be implemented as soon as possible to prevent opening late in the fishing year when poor weather can lead to unsafe fishing conditions. Also, the public commented on this action at the June 2012 South Atlantic Council meeting during the Public Comment Session, and they strongly favored a fall season. The U.S. Coast Guard advised that a red snapper opening in late 2012 could lead to unnecessary accidents from unsafe fishing conditions. The South Atlantic Council considered this information when they made a motion to request a temporary rule for emergency action.

6.2 Timing of Openings and Closings

The proposed action would implement a new red snapper annual catch limit (ACL) in 2012 and establish limited commercial and recreational red snapper seasons. The Regional Administrator (RA) of NOAA Fisheries' Southeast Regional Office would determine the dates of the commercial and recreational season openings and closings. The recreational season would open for two consecutive weekends made up of Fridays, Saturdays, and Sundays, beginning at 12:01 a.m., local time, Friday. The commercial season would open at 12:01 a.m., local time, the Monday following the first recreational weekend opening and close seven days later.

The openings would occur as early as possible in 2012 to prevent an opening late in the year when poor weather can lead to unsafe fishing conditions. The U.S. Coast Guard advised that a red snapper opening in late 2012 could lead to unnecessary accidents from unsafe fishing conditions. Also, the public indicated at the June 2012 South Atlantic Council meeting during the public comment session that they strongly favored a fall season. The Regional Administrator (RA) would determine when severe weather conditions exist, the duration of the severe weather conditions, and which geographic areas are deemed affected by severe weather conditions. If severe weather conditions exist, the RA would file a notification to that effect with the Office of the Federal Register, and announce via NOAA Weather Radio and Fishery Bulletin any change in the red snapper fishing seasons.

6.3 Monitoring of Landings

NOAA Fisheries will monitor the commercial landings through the Commercial Landings Monitoring (CLM) system during and after the seven-day opening. The CLM monitors in-season commercial landings through dealer reports and state trip tickets. Once landings have been reported for the first seven-day commercial opening, NOAA Fisheries will evaluate if the commercial ACL has been met. If the ACL is not met, the season could be reopened.

Monitoring recreational landings from private recreational and for-hire fishermen (charterboat and headboat vessels) offers additional challenges compared to monitoring the commercial landings. Headboat information is collected through headboat logbooks. Fishery managers estimate catch and effort from charterboats and private anglers through Marine Recreational Information Program (MRIP). It is inevitable that there would be some margin of error associated with estimates (as is the case with all surveys), especially due to the relatively short recreational season in 2012. In addition, estimates are collected in two-month time-periods and are not immediately available after the conclusion of the two-month time-period. Due to the constraints with the monitoring program, NOAA Fisheries and state partners are investigating whether the following methods may be used to supplement MRIP: (1) Additional phone calls to charterboat vessels, independent of MRIP, requesting catch and effort information; (2) The addition of a question to the charter phone survey asking how many red snapper caught on each trip; (3) sampling effort at the mouths of inlets; (4) distributing surveys to fishermen at boat ramps and marinas prior to a fishing trip.

6.4 Collection of Biological Information

Fishery-independent and fishery-dependent data comprise a significant portion of information used in stock assessments. Fishery-independent data for red snapper are being collected through the Southeast Fishery Information Survey and the Marine Resources Monitoring Assessment and Prediction Program. The prohibition on harvest and possession of red snapper beginning in early 2010 reduced the collection of fishery-dependent data. The lack of this information has hindered the ability to assess the stock status of the red snapper population and the progress towards rebuilding to target levels. The retention of red snapper will create an opportunity to collect important life history information that fishery scientists could use in the 2014 SEDAR stock assessment. Fishery scientists will collect information such as age (from otoliths), length, and weight of red snapper. Freezers and drop off points will be available for fishermen to leave red snapper carcasses during the reopening. State and federal officials will also collect carcasses during dockside surveys of recreational fishermen (including for-hire vessels). Commercially caught fish will be collected at seafood dealers by port samplers. Commercial catches will be monitored through the NOAA Fisheries Service quota monitoring program. Landings data for headboats will be collected through the Southeast Fisheries Logbook System. NOAA Fisheries Service is currently coordinating with the Florida Fish and Wildlife Conservation Commission and other state agencies to develop enhanced methods for monitoring the for-hire and private catch. Any enhancements would be independent of current MRIP sampling methodologies. After publication of the final rule, the state agencies, South Atlantic Council, and NOAA Fisheries will inform the public through fishery bulletins and electronic social formats of sampling activities that will be occurring during the reopening.

Chapter 7. 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 C.F.R. 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.

Various approaches for assessing cumulative effects have been identified, including checklists, matrices, indices, and detailed models (MacDonald 2000). 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". 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, ecosystems, and human communities identified in scoping in terms of their response to change and capacity to withstand stress.
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.

This CEA for the biophysical environment will follow a modified version of the 11 steps. Cumulative effects for the socio-economic environment will be analyzed separately.

7.1 Biological

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

The Council on Environmental Quality (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 actions **(Chapter 4)**;

II. Which resources, ecosystems, and human communities are affected **(Chapter 3)**; and

III. Which effects are important from a cumulative effects perspective **(information revealed in this Cumulative Effects Analysis (CEA)**

2. Establish the geographic scope of the analysis.

The immediate impact area would be the federal 200-mile limit of the Atlantic off the coasts of North Carolina, South Carolina, Georgia, and east Florida to Key West, which is also the South Atlantic Fishery Management Council's (South Atlantic Council) area of jurisdiction. In light of the available information, the extent of the boundaries would depend upon the degree of fish immigration/emigration and larval transport, whichever has the greatest geographical range. The ranges of affected species are described in **Sections 3.2.2**. **Section 3.1.1** describes the essential fish habitat designation and requirements for species affected by this amendment.

3. Establish the timeframe for the analysis.

Establishing a timeframe for the CEA is important when the past, present, and reasonably foreseeable future actions are discussed. 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 analyses should be initiated when data collection began for the various fisheries. In determining how far into the future to analyze cumulative effects, the length of the effects will depend on the species and the alternatives chosen. Long-term evaluation is needed to determine if management measures have the intended effect of improving stock status. Therefore, analyses of effects should extend beyond the time when these overfished stocks are rebuilt. The South Atlantic Council chose a 35-year rebuilding schedule with management measures that would reduce harvest of red snapper in order to rebuild the stock within the preferred timeframe in Amendment 17A to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP) (Amendment 17A; SAFMC 2010a). A complete description of openings and closures, as well as monitoring methods that would be employed under this temporary action appears in **Chapter 6** of this document.

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).

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 red snapper and co-occurring species (gag, golden tilefish, gray triggerfish, greater amberjack, red grouper, scamp, snowy grouper, and vermilion snapper).

A. Past

The reader is referred to **Section 1.8** of this document and **Appendix C** (History of Management**)** of Amendment 17A for past regulatory activity for the fish species. These include bag and size limits, spawning season closures, commercial quotas, gear prohibitions and limitations, area closures, and a commercial limited access system.

Amendment 13C to the Snapper Grouper FMP (Amendment 13C; SAFMC 2006) addressed overfishing for golden tilefish, snowy grouper, black sea bass and vermilion snapper. Analysis found in **Appendix E** of Amendment 17A showed minimal reductions (< 2%) in commercial red snapper removals resulting from Amendment 13C. Therefore, ancillary effort reductions in the red snapper fishery due to management measures in Amendment 13C would not result in any significant reduction in harvest of red snapper that could be counted toward the overall harvest reductions needed to end overfishing of the species. The South Atlantic Council approved Amendment 13C at their December 2005 meeting. The final rule published in the *Federal Register* on September 12, 2006, and became effective on October 23, 2006.

Amendment 14 to the Snapper Grouper FMP (Amendment 14; SAFMC 2007) was implemented on February 12, 2009. Amendment 14 established eight Type II marine protected areas (MPAs) where fishing for and retention of snapper-grouper species would be prohibited (as would the use of shark bottom longlines), but trolling for pelagic species such as tuna, dolphin, and billfish would be allowed. The intent was to achieve a more natural sex ratio, age, and size structure of all species within the MPAs, while minimizing adverse social and economic effects. Because of the small sizes of the MPAs, it is unlikely that any significant reductions in overall mortality of species also affected by Amendment 17A would occur. The South Atlantic Council approved Amendment 14 at their June 2007 meeting. The final rule published in the *Federal Register* on January 13, 2009, and became effective on February 12, 2009.

Amendment 15B to the Snapper Grouper FMP (Amendment 15B; SAFMC 2008b) became effective on December 16, 2009. Management measures in Amendment 15B include prohibition of the sale of bag limit caught snapper grouper species for fishermen not holding a federal commercial permit for South Atlantic snapper grouper, an action to adopt, when implemented, the Atlantic Coastal Cooperative Statistics Program release, discard and protected species module to assess and monitor bycatch, allocations for snowy grouper, and management reference points for golden tilefish. Biological benefits from Amendment 15B are not expected to result in a significant cumulative biological effect when added to anticipated biological impacts under this amendment. The South Atlantic Council approved Amendment 14 at their June 2007 meeting. The final rule published in the *Federal Register* on January 13, 2009, and became effective on February 12, 2009.

Amendment 17B to the Snapper Grouper FMP (Amendment 17B; SAFMC 2010b), which was implemented on January 31, 2011 established annual catch limits (ACL), annual catch targets, and accountability measures (AMs) for 8 species experiencing overfishing; modified management measures to limit total mortality to the ACL; and updated the framework procedure for specification of total allowable catch. Amendment 17B also prohibited the harvest and possession of deepwater snapper grouper species (snowy grouper, blueline tilefish, yellowedge grouper, misty grouper, queen snapper, and silk snapper) at

depths greater than 240 feet. The intent of this measure was to reduce bycatch of speckled hind and warsaw grouper. The South Atlantic Council approved Amendment 15B at their June 2008 meeting. The final rule published in the *Federal Register* on November 16, 2009, and became effective on December 16, 2009.

The Comprehensive ACL Amendment (SAFMC 2011b) includes ACLs and AMs for federally managed species not undergoing overfishing in four FMPs (Snapper Grouper, Dolphin Wahoo, Golden Crab, and *Sargassum*). Actions contained within the Comprehensive ACL Amendment include: (1) Removal of species from the snapper grouper fishery management unit; (2) designation of ecosystem component species; (3) allocations; (4) management measures to limit recreational and commercial sectors to their ACLs; (5) AMs; and (6) any necessary modifications to the range of regulations. The South Atlantic Council approved the Comprehensive ACL Amendment in September 2011. The final rule published in the *Federal Register* on March 16, 2012, and became effective on April 16, 2012.

Regulatory Amendment 11 to the Snapper Grouper FMP (Regulatory Amendment 11; SAFMC 2011c) was approved by the South Atlantic Council at their August 9, 2011, meeting. The amendment implemented regulations to remove the deepwater closure beyond 240 ft for six deepwater snapper grouper species that was approved in Amendment 17B. The South Atlantic Council approved Regulatory Amendment 11 at their August 2011 meeting. The final rule published in the *Federal Register* on May 12, 2012, and became effective on same day.

Amendment 18A to the Snapper Grouper FMP (Amendment 18A; SAFMC 2011d) contains measures to limit participation and effort for black sea bass. Amendment 18A established an endorsement program than enables snapper grouper fishermen with a certain catch history to harvest black sea bass with pots. In addition Amendment 18A includes measures to reduce bycatch in the black sea bass pot fishery, modify the rebuilding strategy, and other necessary changes to management of black sea bass as a result of a 2011 stock assessment. The South Atlantic Council approved Amendment 18A in December 2011. The amendment was partially approved and the final rule published in the *Federal Register* on June 1, 2012, and became effective on July 1, 2012.

Amendment 24 to the Snapper Grouper FMP (Amendment 24; SAFMC 2011e) implemented a rebuilding plan for red grouper, which is overfished and undergoing overfishing. The South Atlantic Council approved Amendment 24 in December 2011. The final rule published in the *Federal Register* on June 11, 2012, and became effective on July 11, 2012.

B. Present

In addition to snapper grouper fishery management issues being addressed in this amendment, several other snapper grouper amendments have been developed concurrently and are in the process of approval and implementation. Not all of these amendments directly affect red snapper.

Amendment 20A to the Snapper Grouper FMP (Amendment 20A; SAFMC 2011g) would distribute shares from inactive participants in the wreckfish individual transferable quota (ITQ) to active shareholders. The South Atlantic Council approved Amendment 20A in December 2011. The proposed

rule for Amendment 20A published in the *Federal Register* on March 20, 2012, and the comment period ended on April 30, 2012.

Regulatory Amendment 12 to the Snapper Grouper FMP (Regulatory Amendment 12; SAFMC 2012) includes alternatives to adjust the golden tilefish ACL based on the results of a new assessment, which indicates golden tilefish are no longer experiencing overfishing and are not overfished. Regulatory Amendment 12 also includes an action to adjust the recreational AM. Regulatory Amendment 12 was approved for submission to the Secretary of Commerce by the South Atlantic Council at their March 2012 meeting.

In a letter dated June 19, 2012, the South Atlantic Council requested NOAA Fisheries to allow harvest and possession of red snapper in 2012 through emergency regulations. At their June 11-15, 2012, meeting, the South Atlantic Council reviewed new information in the form of red snapper rebuilding projections, 2012 acceptable biological catch levels, and 2012 discard mortality levels. After accounting for the 2012 discard mortalities, the South Atlantic Council determined that directed harvest could be allowed without compromising the rebuilding of the stock to target levels.

The South Atlantic Council has recently completed and is developing amendments for coastal migratory pelagic species, spiny lobster, golden crab, dolphin-wahoo, shrimp, and octocorals. See the South Atlantic Council's Web site at http://www.safmc.net/ for further information on South Atlantic Council managed species.

C. Reasonably Foreseeable Future

Amendment 20B to the Snapper Grouper FMP is currently under development. The amendment will include a formal review of the current wreckfish individual transferable quota (ITQ) program, and will update/modify that program according to recommendations gleaned from the review.

Amendment 18B to the Snapper Grouper FMP was approved by the South Atlantic Council at their June 2012 meeting and considers alternatives addressing golden tilefish. Specifically, actions could establish initial eligibility requirements and address trip limits for a golden tilefish longline endorsement program, allocate golden tilefish quota among gear groups, adjust the golden tilefish fishing year, and establish an appeals process.

At their June 2012 meeting the South Atlantic Council further discussed Amendment 22 to the Snapper Grouper FMP to consider measures such as a tagging program to allow harvest of red snapper as the stock rebuilds. Scoping of Amendment 22 was conducted during January and February 2011.

At their March 2012 meeting, the South Atlantic Council requested the development of a new regulatory amendment to allow for adjustment of allocations and ACLs based on the new landings information from the Marine Recreational Information Program.

At their June 2012 meeting the South Atlantic Council requested development of a regulatory amendment to adjust management measures for greater amberjack, vermilion snapper, black sea bass, gray triggerfish, and vermilion snapper.

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

A. Past
B. Present
C. Reasonably foreseeable future

In terms of natural disturbances, it is difficult to determine the effect of non-Council and non-fishery related actions on stocks of snapper grouper species. Annual variability in natural conditions such as water temperature, currents, food availability, predator abundance, etc. can affect the abundance of young fish, which survive the egg and larval stages each year to become juveniles (i.e., recruitment). This natural variability in year class strength is difficult to predict as it is a function of many interactive and synergistic factors that cannot all be measured (Rothschild 1986). Furthermore, natural factors such as storms, red tide, cold water upwelling, etc. can affect the survival of juvenile and adult fishes; however, it is very difficult to quantify the magnitude of mortality these factors may have on a stock. Alteration of preferred habitats for snapper grouper species could affect survival of fish at any stage in their life cycles. However, estimates of the abundance of fish, which utilize any number of preferred habitats, as well as, determining the impact habitat alteration may have on snapper grouper species, is problematic.

The snapper grouper ecosystem includes many species, which occupy the same habitat at the same time. For example, red snapper co-occur with vermilion snapper, tomtate, scup, red porgy, white grunt, black sea bass, red grouper, scamp, gag, and others. Therefore, red snapper are likely to be caught and suffer some mortality when regulated since they will be incidentally caught when fishermen target other co-occurring species. Red snapper recruitment has been measured from the 1950's to the present time and shows a decline from the earliest years to a low in the mid-1900s. Since then there have been several moderately good year classes in 1998, 1999, and 2000, and then another decline through 2003, with an apparent strong year class occurring in 2006. These moderately good year classes have grown and entered the fishery over the past couple years and are likely responsible for the higher catches being reported by recreational and commercial fishermen. Other natural events such as spawning seasons, and aggregations of fish in spawning condition can make some species especially vulnerable to targeted fishing pressure. Such natural behaviors are discussed in further detail in **Chapter 3** of this document, which is hereby incorporated by reference.

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

The BP/Deepwater Horizon oil spill event, which occurred in the Gulf of Mexico on April 20, 2010, did not impact fisheries operating the South Atlantic. Oil from the spill site was not been detected in the South Atlantic region, and did not likely to pose a threat to the South Atlantic red snapper.

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

In terms of the biophysical environment, the resources/ecosystems identified in earlier steps of the CEA are the fish populations directly or indirectly affected by the regulations. This step should identify the trends, existing conditions, and the ability to withstand stresses of the environmental components.

The species most likely to be impacted by alternatives considered in the temporary measures through this emergency action is red snapper, *Lutjanus campechanus*. Trends in the condition of red snapper are determined through the Southeast Data, Assessment and Review (SEDAR) process. In 2010, red snapper was assessed in SEDAR 24, using landings, age, length, and abundance index data through 2009. SEDAR 24 (2010) determined the red snapper stock to be undergoing overfishing and overfished **(**see **Table 3-1** in **Chapter 3)**. More information on the SEDAR Assessments for red snapper can be found in **Section 3.2.3**.

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

This step is important in outlining the current and probable stress factors on snapper grouper species identified in the previous steps. The goal is to determine whether these species are approaching conditions where additional stresses could have an important cumulative effect beyond any current plan, regulatory, or sustainability threshold (CEQ 1997). Sustainability thresholds can be identified for some resources, which are levels of impact beyond which the resources cannot be sustained in a stable state. Other thresholds are established through numerical standards, qualitative standards, or management goals. The CEA should address whether thresholds could be exceeded because of the contribution of the proposed action to other cumulative activities affecting resources.

Fish populations

Numeric values of overfishing and overfished thresholds were updated in Amendment 17A for red snapper. These values includes maximum sustainable yield (MSY), the fishing mortality rate that produces MSY (F_{MSY}), the biomass or biomass proxy that supports MSY (B_{MSY}), the minimum stock size threshold below which a stock is considered to be overfished (MSST), the maximum fishing mortality threshold above which a stock is considered to be undergoing overfishing (MFMT), and optimum yield (OY).

Definitions of overfishing and overfished for red snapper can be found in the most recent stock assessment sources included in **Table 3.1** of this document. Applicable stock assessment sources for red snapper include SEDAR 24 (2010) and SEDAR 15 (2008), both of which determined the red snapper stock to be undergoing overfishing and overfished.

Climate change

Global climate changes could have significant effects on South Atlantic fisheries. However, the extent of these effects is not known at this time. Possible impacts include temperature changes in coastal and marine ecosystems that can influence organism metabolism and alter ecological processes such as productivity and species interactions; changes in precipitation patterns and a rise in sea level which could change the water balance of coastal ecosystems; altering patterns of wind and water circulation in the

ocean environment; and influencing the productivity of critical coastal ecosystems such as wetlands, estuaries, and coral reefs (IPCC 2007; Kennedy et al. 2002).

It is unclear how climate change would affect snapper grouper species in the South Atlantic. Climate change can affect factors such as migration, range, larval and juvenile survival, prey availability, and susceptibility to predators. In addition, the distribution of native and exotic species may change with increased water temperature, as may the prevalence of disease in keystone animals such as corals and the occurrence and intensity of toxic algae blooms. Climate change may significantly impact snapper grouper species in the future, but the level of impacts cannot be quantified at this time, nor is the time frame known in which these impacts will occur.

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. The SEDAR assessments show trends in biomass, fishing mortality, fish weight, and fish length going back to the earliest periods of data collection. For some species such as snowy grouper, assessments reflect initial periods when the stock was above B_{MSY} and fishing mortality was fairly low. However, some species were heavily exploited or possibly overfished when data were first collected. As a result, the assessment must make an assumption of the biomass at the start of the assessment period thus modeling the baseline reference points for the species.

For a detailed discussion of the baseline conditions of red snapper, the reader is referred to those stock assessment and stock information sources referenced in **Item Number 6** of this CEA.

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

Table 7-1. The cause and effect relationship of fishing and regulatory actions within the time period of the Cumulative Effects Analysis (CEA).

Time period/dates	Cause	Observed and/or Expected Effects
Pre-January 12, 1989	Habitat destruction, growth overfishing of vermilion snapper.	Damage to snapper grouper habitat, decreased yield per recruit of vermilion snapper.
January 1989	Trawl prohibition to harvest fish (SAFMC 1988).	Increase yield per recruit of vermilion snapper; eliminate trawl damage to live bottom habitat.
Pre-January 1, 1992	Overfishing of many snapper grouper species.	Spawning stock ratio of these species is estimated to be less than 30% indicating that they are overfished.
January 1992	Prohibited gear: fish traps south of Cape Canaveral, FL; entanglement nets; longline gear inside of 50 fathoms; powerheads and bangsticks in designated SMZs off SC. Size/Bag limits: 10” TL vermilion snapper (recreational only); 12” TL vermilion snapper (commercial only); 10 vermilion snapper/person/day;	Reduce mortality of snapper grouper species.

Time period/dates	Cause	Observed and/or Expected Effects
	aggregate grouper bag limit of 5/person/day; and 20" TL gag, red, black, scamp, yellowfin, and yellowmouth grouper size limit (SAFMC 1991).	
Pre-June 27, 1994	Damage to *Oculina* habitat.	Noticeable decrease in numbers and species diversity in areas of *Oculina* off FL
July 1994	Prohibition of fishing for and retention of snapper grouper species (HAPC renamed OECA; SAFMC 1993)	Initiated the recovery of snapper grouper species in OECA.
1992-1999	Declining trends in biomass and overfishing continue for a number of snapper grouper species including golden tilefish.	Spawning potential ratio for golden tilefish is less than 30% indicating that they are overfished.
July 1994	Commercial quota for golden tilefish; commercial trip limits for golden tilefish; include golden tilefish in grouper recreational aggregate bag limits.	
February 24, 1999	All S-G without a bag limit: aggregate recreational bag limit 20 fish/person/day, excluding tomtate and blue runners. Vessels with longline gear aboard may only possess snowy, Warsaw, yellowedge, and misty grouper, and golden, blueline and sand tilefish.	
Effective October 23, 2006	Snapper grouper FMP Amendment 13C (SAFMC 2006)	Commercial vermilion snapper quota set at 1.1 million lbs gw; recreational vermilion snapper size limit increased to 12" TL to prevent vermilion snapper overfishing.
Effective February 12, 2009	Snapper grouper FMP Amendment 14 (SAFMC 2007)	Use marine protected areas (MPAs) as a management tool to promote the optimum size, age, and genetic structure of slow growing, long-lived deepwater snapper grouper species (e.g., speckled hind, snowy grouper, warsaw grouper, yellowedge grouper, misty grouper, golden tilefish, blueline tilefish, and sand tilefish). Gag and vermilion snapper occur in some of these areas.
Effective March 20, 2008	Snapper grouper FMP Amendment 15A (SAFMC 2008a)	Establish rebuilding plans and SFA parameters for snowy grouper, black sea bass, and red porgy.
Effective Dates Dec 16, 2009, to Feb 16, 2010.	Snapper grouper FMP Amendment 15B (SAFMC 2008b)	End double counting in the commercial and recreational reporting systems by prohibiting the sale of bag-limit caught snapper grouper, and minimize impacts on sea turtles and smalltooth sawfish.

Time period/dates	Cause	Observed and/or Expected Effects
Effective Date July 29, 2009	Snapper grouper FMP Amendment 16 (SAFMC 2009a)	Protect spawning aggregations and snapper grouper in spawning condition by increasing the length of the spawning season closure, decrease discard mortality by requiring the use of dehooking tools, reduce overall harvest of gag and vermilion snapper to end overfishing.
Effective Date January 4, 2010	Red Snapper Interim Rule	Prohibit commercial and recreational harvest of red snapper from January 4, 2010, to June 2, 2010 with a possible 186-day extension. Reduce overfishing of red snapper while long-term measures to end overfishing are addressed in Amendment 17A.
Effective Dates June 3, 2010, to Dec 5, 2010	Extension of Red Snapper Interim Rule	Extended the prohibition of red snapper to reduce overfishing of red snapper while long-term measures to end overfishing are addressed in Amendment 17A.
Effective Date December 4, 2010	Snapper Grouper FMP Amendment 17A (SAFMC 2010a).	SFA parameters for red snapper; ACLs and ACTs; management measures to limit recreational and commercial sectors to their ACTs; accountability measures. Establish rebuilding plan for red snapper. Large snapper grouper area closure inn EEZ of NE Florida. Emergency rule delayed the effective date of the snapper grouper closure.
Effective Date June 1, 2011	Regulatory Amendment 10 (SAFMC 2011h)	Removal of snapper grouper area closure approved in Amendment 17A.
Effective Date January 31, 2011	Snapper Grouper Amendment 17B (SAFMC 2010b)	ACLs and ACTs; management measures to limit recreational and commercial sectors to their ACTs; AMs, for species undergoing overfishing. Established a harvest prohibition of six snapper grouper species in depths greater than 240 feet.
Effective Date July 1, 2012	Snapper Grouper FMP Amendment 18A (SAFMC 2011d)	Prevent overexploitation in the black sea bass fishery.
Effective Date April 16, 2012	Comprehensive ACL Amendment (SAFMC 2011b)	ACLs ACTs, and AMs for species not experiencing overfishing; accountability measures; an action to remove species from the fishery management unit as appropriate; and management measures to limit recreational and commercial sectors to their ACTs.

Time period/dates	Cause	Observed and/or Expected Effects
Effective Date July 15, 2011	Regulatory Amendment 9 (SAFMC 2011f)	Harvest management measures for black sea bass; commercial trip limits for gag, vermilion and greater amberjack
Effective Date May 10, 2012	Regulatory Amendment 11 (SAFMC 2011c)	Removed the harvest prohibition of six deepwater snapper grouper species implemented in Amendment 17B.
Target 2012	Amendment 18A Transferability Amendment	Reconsider action to allow for transfer of black sea bass pot endorsements that was disapproved in Amendment 18A.
Target 2012	Amendment 20A (Wreckfish) (SAFMC 2011g)	Redistribute inactive wreckfish shares.
July 11, 2012	Amendment 24 (Red Grouper) (SAFMC 2011e)	Establishes a rebuilding plan for red grouper, specifies ABC, and establishes ACL, ACT and revises AMs for the commercial and recreational sectors.
Target 2012	Regulatory Amendment 12 (SAFMC 2012)	Adjusts the golden tilefish ACL based on the results of a new stock assessment and modifies the recreational golden tilefish AM.
Target 2013	Snapper Grouper Amendment 18B (under dev)	Develop a long-term management program for red snapper in the South Atlantic.
Target 2013	Snapper Grouper Amendment 22 (under dev)	Develop a long-term management program for red snapper in the South Atlantic.

9. Determine the magnitude and significance of cumulative effects.

Amendment 17A established ACLs and AMs and established management measures to end red snapper overfishing and are expected to have a beneficial, cumulative effect on the biophysical environment. Proposed management actions in Amendment 17A, and the magnitude and significance of the preferred alternatives as summarized in **Sections 2 and 4** of that amendment and are hereby incorporated by reference. These management actions are expected to protect and increase stock biomass, which may affect other stocks.

When species in the snapper grouper fishery management unit (FMU) are assessed, stock status may change as new information becomes available. In addition, changes in management regulations, fishing techniques, social/economic structure, etc. can result in shifts in the percentage of harvest between user groups over time. As such, the South Atlantic Council has determined that certain aspects of the current management system remain inappropriate and should be restructured. **The South Atlantic Council and NOAA Fisheries determined that retention of a limited number of red snapper in 2012, along with appropriate management controls, would not jeopardize the rebuilding of the red snapper stock. Fishery managers made this determination following a comparison of the allowable mortality for red snapper in 2012 with recent discards levels. The method is described in more detail in Section 1.6 and Appendix C.** Furthermore, **Chapters 2** and **4** of this document, which considers reopening

harvest of red snapper for a limited time, describe the magnitude and significance of effects of the alternatives considered, in detail.

The red snapper rebuilding plan and management measures implemented by Amendment 17A would result in a slow rebuilding of the stock over the course of many years. One ancillary benefit of restricting red snapper harvest is reductions in fishing related mortality of other species associated with red snapper. However, it is not possible to eliminate incidental mortality of red snapper, since it is part of a multi-species complex, without prohibiting fishermen from targeting all associated species wherever red snapper occur (see **Appendix E** for the bycatch practicability analysis).

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. Avoidance, minimization, and mitigation are not applicable.

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

The effects of the proposed action are, and will continue to be, monitored through collection of data by NOAA Fisheries, states, stock assessments and stock assessment updates, life history studies, and other scientific observations. **Section 6.3** of this document explains how the limited harvest of red snapper in 2012 will be monitored.

7.2 Socioeconomic

A description of the human environment, including a description of commercial and recreational red snapper fisheries and associated key fishing communities is contained in **Chapter 3**. A description of the history of management of the red snapper fishery is contained in **Chapter 1**.

Participation in and the economic performance of the snapper grouper fishery, which includes red snapper, has been affected by a combination of regulatory, biological, social, and external economic factors. Regulatory measures have obviously affected the quantity and composition of harvests, through the various size limits, seasonal restrictions, trip or bag limits, and quotas. Gear restrictions, notably fish trap and longline restrictions, have also affected harvests and economic performance. The limited access program implemented in 1998/1999 substantially affected the number of participants in the fishery. Biological forces that either motivate certain regulations or simply influence the natural variability in fish stocks have played a role in determining the changing composition of the fishery. Additional factors, such as changing career or lifestyle preferences, stagnant to declining ex-vessel fish prices due to imports, increased operating costs (e.g., gas, ice, insurance, dockage fees, etc.), and increased waterfront/coastal value leading to development pressure for non-fishery uses have impacted both the commercial and recreational fishing sectors.

Given the variety of factors that affect fisheries, persistent data issues, and the complexity of trying to identify cause-and-effect relationships, it is not possible to differentiate actual or cumulative regulatory effects from external cause-induced effects. In general, it can be stated, however, that the regulatory environment for all fisheries has become progressively more complex and burdensome, increasing, in tandem with other adverse influences, the likelihood of economic losses, business failure, occupational

changes, and associated adverse pressures on associated families, communities, and industries. Some reverse of this trend is possible and expected. The establishment of ACLs and AMs for species undergoing overfishing is expected to help protect and sustain harvest at the OY level. However, certain pressures would remain, such as total effort and total harvest considerations, increasing input costs, import induced price pressure, and competition for coastal access.

A detailed description of the expected social and economic impacts of the actions in this amendment is contained in **Chapter 4**. Current and future amendments are expected to add to this cumulative effect. Amendment 15B prohibited the sale of bag-limit caught snapper grouper species for those who do not hold a federal commercial permit for snapper grouper. This eliminates the ability of the recreational angler to subsidize the cost of a fishing trip through the sales of snapper grouper and may, therefore, decrease recreational demand. This action has a more pronounced effect on the for-hire sector, which often uses the sale of bag-limit caught fish to pay crewmembers.

Amendment 16 to the Snapper Grouper FMP (Amendment 16; SAFMC 2009) addressed overfishing of gag and vermilion snapper. The corrective action in response to overfishing always requires harvest reductions and more restrictive regulation. Thus, additional short-term adverse social and economic effects would be expected. These restrictions will hopefully prevent the stocks from becoming overfished, which would require recovery plans, further harvest restrictions, and additional social and economic losses.

Amendment 17A addressed the overfishing and overfished status of red snapper. Red snapper is, in general and compared to other snapper grouper species, not a significant commercial species, it has greater importance as a target species to the recreational sector, especially the for-hire sector in certain areas of the South Atlantic.

Amendment 17B specified harvest controls (ACLs and/or ACTs) and AMs for several snapper grouper species, and modified the framework to allow more efficient modification of these measures in the future, where necessary. While some final specifications of these measures may result in additional short-term reductions in social and economic benefits to participants in the fisheries, these measures would be expected to support more stable management and sustainable social and economic benefits from enhanced resource protection, larger and/or more consistent harvests, and long-term stable stocks.

The cumulative impact of Amendments 16, 17A, and 17B are expected to be significant for commercial and recreational fisheries participants and those indirectly impacted by the actions contained in those amendments. The cumulative impact of Amendments 17A and 17B have been estimated and are contained in Amendment 17A. The impacts from the three amendments will likely result in commercial and for-hire vessel exit and loss of fishery infrastructure as a result.

Other amendments are expected to or have been implemented during 2012, which could further affect harvest of snapper grouper species. The Comprehensive ACL Amendment, implemented on April 16, 2012, specified ACLs for snapper grouper species not undergoing overfishing, and also specified allocations for red snapper. Amendment 18A, which was implemented on July 1, 2012, contains measures to limit participation and effort in the black sea bass fishery, reduce bycatch in the black sea bass pot sector, changes to the rebuilding strategy and other necessary changes to the management of black sea bass as a result of the 2011 stock assessment. Regulatory Amendment 11 to the Snapper Grouper FMP became effective on May 10, 2012 and removed the deepwater closure beyond 240 ft for

six deepwater snapper grouper species. Amendment 20A to the Snapper Grouper FMP would distribute shares from inactive participants in the wreckfish individual transferable quota system to active shareholders. Amendment 24 to the Snapper Grouper FMP, which became effective on July 11, 2012, implemented a rebuilding plan for red grouper, which is overfished and undergoing overfishing. Regulatory Amendment 12 to the Snapper Grouper FMP (Regulatory Amendment 12) includes alternatives to increase the ACL for golden tilefish based on the results of a new stock assessment. The South Atlantic Council approved Regulatory Amendment 12 at their March 2012 meeting for review by the Secretary of Commerce.

Finally, the space industry in Florida centered on Cape Canaveral is experiencing severe difficulties due to the ramping down and cancellation of the Space Shuttle Program. This program's loss coupled with additional fishery closures will negatively impact this region. However, declining economic conditions due to decline in the space industry may lessen the pace of waterfront development and associated adverse social and economic pressures on fishery infrastructure.

The overall cumulative social effects of the actions within the temporary rule should be positive. While some alternatives have the potential to increase the chances for negative social effects like derby fishing and high grading, with the selected preferred alternatives many of the negative effects can be ameliorated. It is assumed that those communities identified in **Section 3.3.1** will benefit from the positive social effects of the regulatory actions. It is unlikely that there would be any negative social effects to other communities as a result. While these cumulative impacts are positive, they are also short term as the temporary rule is for a short period of time during the 2012 fishing year. The long term benefits of the actions contained within this EA, will need to be assessed with regard to the impact upon the stock status of the fishery and social environment overall. Changes in fishing behavior which may have short term positive impacts for one sector or fishery, can have differing impacts in others and therefore may have different long term impacts overall. While we assume these regulatory changes should have short term positive social impacts like improving fishing opportunities for both the recreational and commercial sectors and the associated socioeconomic benefits that follow, we will not know the long term impacts until we have a better understanding of how behaviors are modified by these actions. With the temporary opening, it is unlikely that any substantial long term negative impacts should occur as long as harvest for both sectors is monitored in a timely manner and ACLs are not exceeded. Overall perception of both the South Atlantic Council and NOAA Fisheries should benefit from the temporary rule that takes into consideration some of the socioeconomic concerns that stakeholders expressed during previous regulatory action. This may have positive social effects of improving compliance and cooperation in future management.

Chapter 8. List of Preparers

Table 8-1. List of preparers of the document.

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NMFS = National Marine Fisheries Service, SAFMC = South Atlantic Fishery Management Council, SF = Sustainable Fisheries Division, PR = Protected Resources Division, SERO = Southeast Regional Office, HC = Habitat Conservation Division, GC = General Counsel, Eco=Economics

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Chapter 9. Agencies and Persons Consulted

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List of Agencies, Organizations, and Persons Consulted
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SAFMC Snapper Grouper Advisory Panel
SAFMC Scientific and Statistical Committee
SAFMC Information and Education Advisory Panel
North Carolina Coastal Zone Management Program
South Carolina Coastal Zone Management Program
Georgia Coastal Zone Management Program
Florida Coastal Zone Management Program
Florida Fish and Wildlife Conservation Commission
Georgia Department of Natural Resources
South Carolina Department of Natural Resources
North Carolina Division of Marine Fisheries
North Carolina Sea Grant
South Carolina Sea Grant
Georgia Sea Grant
Florida Sea Grant
Atlantic States Marine Fisheries Commission
Gulf and South Atlantic Fisheries Development Foundation
Gulf of Mexico Fishery Management Council
National Marine Fisheries Service
- Washington Office
- Office of Ecology and Conservation
- Southeast Regional Office
- Southeast Fisheries Science Center

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