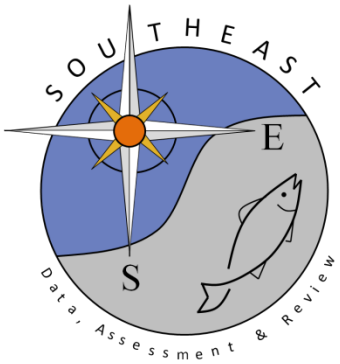
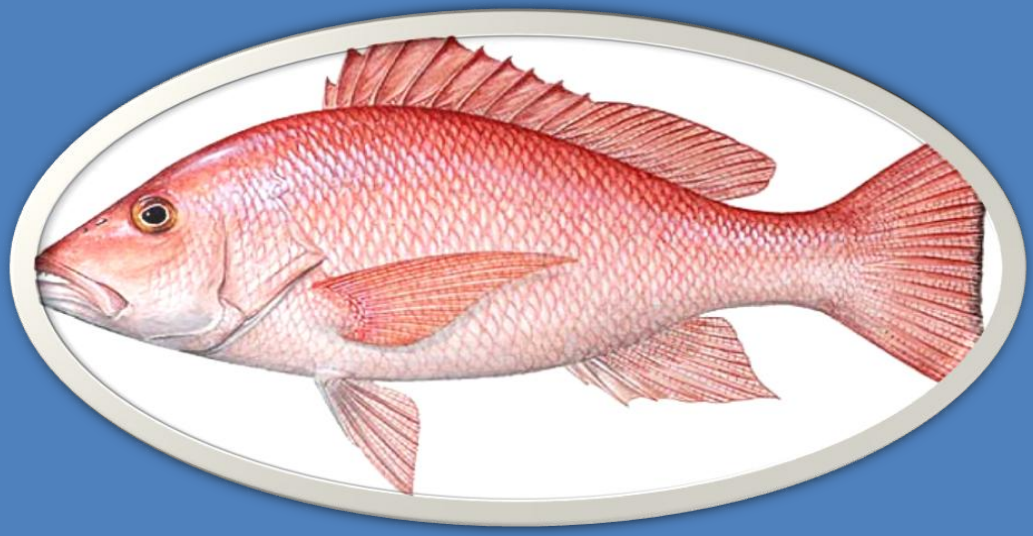
Amendment 28 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region

SAFMC

SEDAR41-RD12

16 May 2014





Amendment 28

to the Fishery Management Plan for
the Snapper Grouper Fishery of the South
Atlantic Region

Changes to Red Snapper Management Measures, Including the Establishment of a Process to Determine Future Annual Catch Limits and Fishing Seasons

Environmental Assessment Regulatory Impact Review Fishery Impact Statement

JANUARY 2013

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

B_{MSY} the stock biomass expected to exist under equilibrium conditions when fishing at F_{MSY}

B_{OY} the stock biomass expected to exist under equilibrium conditions when fishing at F_{OY}

B_{CURR} the current stock biomass

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

$F_{30\%SPR}$ fishing mortality that will produce a static SPR = 30%

F_{CURR} the current instantaneous rate of fishing mortality

F_{MSY} the rate of fishing mortality expected to achieve MSY under equilibrium conditions and a corresponding biomass of B_{MSY}

F_{OY} the rate of fishing mortality expected to achieve OY under equilibrium conditions and a corresponding biomass of B_{OY}

FEIS final environmental impact statement

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

Amendment 28 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region

Documents:	FMP Amendment Environmental Assessment Regulatory Impact Review Fishery Impact Statement
Proposed actions:	Changes to red snapper management measures, including the establishment of a process to determine future annual catch limits and fishing seasons
Lead agency:	FMP Amendment – South Atlantic Fishery Management Council EA – National Marine Fisheries Service (NMFS)
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Table of Contents

List of Appendices

List of Figures

List of Tables

SUMMARY

of

AMENDMENT 28

to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region

Why is the South Atlantic Council Taking Action?

A stock assessment completed in February 2008 determined the red snapper stock in the South Atlantic is experiencing overfishing and is overfished. Beginning January 4, 2010, harvest and possession of red snapper was prohibited in or from the South Atlantic exclusive economic zone.

A limited red snapper fishing season was established in 2012 through an emergency action under the Magnuson-Stevens Fishery Conservation and Management Act. The South Atlantic Fishery Management Council (South Atlantic Council) determined that some directed harvest could be allowed without compromising the rebuilding of the red snapper stock to target levels, and they saw the limited harvest as an opportunity to collect additional data on red snapper. Through Amendment 28 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP), the South Atlantic Council intends to establish a process that would allow this type of limited harvest for red snapper to occur in 2013 and in the future, depending on the projected mortalities (landings and discards) for the current fishing year, and the amount of harvest from the previous year.

What are the Alternatives in Amendment 28?

1. No action. In 2012, ACL=13,067 fish (20,818 lbs gutted weight (gw) comm./9,399 fish rec). In 2013, ACL = 0 (landings) and prohibition. The 20-inch total length (TL) minimum size limit is currently not in effect, as red snapper may not be harvested or possessed in or from the South Atlantic EEZ.
2. Computing ACL
   - 2a. Equation 1: 2012 Temporary Rule Method
   - 2b. Equation 2: Previous Year Ratio Method
   - **2c (Preferred). Equation 3: Two Previous Years Ratio Method**
3. Commercial fishing season
   - **3a (Preferred). Begins 12:01 AM on 2nd Monday in July**
   - 3b. Begins 12:01 AM on 1st Monday in August
   - 3c. Begins 12:01 AM on 2nd Monday in September
4. Recreational fishing season (weekends)
   - **4a (Preferred). Begins 12:01 AM on 2nd Friday in July**
   - 4b. Begins 12:01 AM on 1st Friday in August
   - 4c. Begins 12:01 AM on 2nd Friday in September
5. **(Preferred). Eliminate 20-inch total length (TL) minimum size limit**
6. Commercial trip limit
   - 6a. 25 lbs gw
   - 6b. 50 lbs gw
   - **6c (Preferred). 75 lbs gw**
   - 6d. 100 lbs gw
7. **(Preferred). Recreational bag limit of 1 fish per person per day**

If Implemented, How Would the Process Work?

The acceptable biological catch (ABC) for 2012 was 86,000 fish. Estimated landings and dead discards that occurred in 2012 will be available around March 2013. If the National Marine Fisheries Service (NMFS) determines that the estimated landings and dead discards that occurred in 2012 are equal to or greater than 86,000 fish, no harvest would be allowed in 2013.

If NMFS determines that the estimated landings and dead discards that occurred in 2012 is less than 86,000 fish, harvest *may* be allowed in 2013. (Note: The commercial fishing season and the recreational fishing seasons would not open if their 2013 projected season length is three days or less.)

The 2013 ABC is from rebuilding projections contained in Table 9c of a document titled "SEDAR-24 South Atlantic Red Snapper: Management quantities and projections requested by the SSC and SERO" and in Table 1-1 of this document. The 2013 ABC equals 96,000 fish. NMFS would calculate the total annual catch limit (ACL) as per the formula implemented thorough this amendment and the sector-ACLs as per the South Atlantic Council's allocation formula. NMFS would project the length of the commercial and recreational fishing seasons.

If harvest is allowed, NMFS would announce the pre-determined commercial and recreational fishing year start dates. The end of the commercial red snapper season would close when the sector ACL is met or projected to be met. The end of the recreational red snapper season would be projected and announced before the start of the recreational season. The NMFS Regional Administrator has the authority to delay the opening of red snapper fishing seasons in the event of a tropical storm or hurricane affecting the South Atlantic Council's area of authority.

The process would be repeated each year unless modified.

Summary of Effects

Action 1. Red Snapper ACLs, AMs, and Fishing Seasons

Biological Effects

Unsustainable fishing pressure **(Figure S-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 S-2)**.

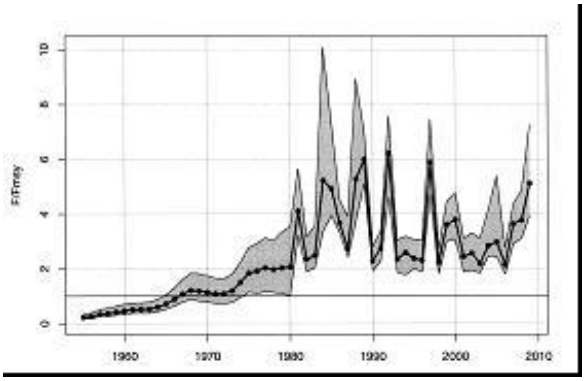


Figure S-1. The overfishing ratio for red snapper over time. The stock is undergoing overfishing when the F/F_{MSY} is greater than one (SEDAR 24 2010).

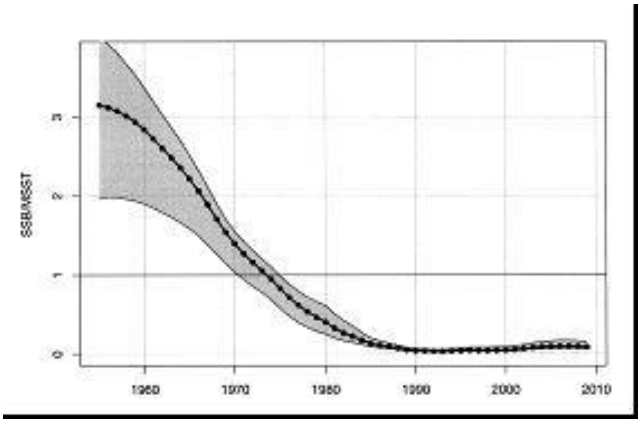


Figure S-2. The overfished ratio for red snapper over time. The stock is overfished when the SSB/MSST is less than one (SEDAR 24 2010).

In response to the overfishing and overfished stock status of red snapper, fishery managers implemented a harvest and possession prohibition on January 4, 2010. This replaced the 2 fish recreational bag limit and 20" recreational and commercial size limit implemented through Snapper Grouper Amendment 4 (SAFMC 1991). Through Amendment 17A to the Fishery Management Plan for the Snapper-Grouper Fishery of the South Atlantic Region, 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 Council and NMFS 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.

Alternatives 2 through 4 – Allowing limited harvest in 2013 and beyond

Alternatives 2 through **4** would potentially allow limited harvest and possession of red snapper each year beginning in 2013.

Alternative 2 would establish the formula to determine the ACL. **Sub-alternative 2a** would employ the same equation that was used to calculate the 2012 ACL. To determine the ACL for the 2012 opening, 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 **Appendix A** of the amendment document. **Sub-alternatives 2b** and **2c (Preferred)** would each compare *ratios* of total kill and allowable catch in previous years to a future ABC to determine the level of removals that would be allowed.

Alternatives 2 through **4** could have negligible biological effects since the same amount of red snapper previously killed through regulatory discards would still die but fishermen would be allowed to retain them instead of throwing them back. 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 lower adverse effects from lowering ACLs since lower ACLs reduce the length of fishing seasons, provide a larger buffer from the ABC, and may reduce the chance that overfishing of the stock would occur. 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 may increase. Increased fishing effort may be more likely in the recreational sector (charter boats, headboats, and private) than in the commercial sector. For-hire fishermen from northern Florida and Georgia have often testified that potential customers have been unwilling to book trips without the opportunity to retain red snapper. Conversely, the establishment of a short 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 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 have occurred.

Alternative 5 – Minimum size limit removal

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.

Biological impacts of minimum size limits

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

Alternative 1 (No action) would retain the red snapper 20-inch Total Length (TL) minimum size limit; however, the size limit is not currently applicable due to the prohibition on the harvest and possession of red snapper. If the season were to open, as proposed under **Alternatives 2** through **4**, and no action was taken to change the size limit, then the minimum size limit of 20 inches TL would still apply. **Alternative 5** would remove the size limit. Both **Alternatives 1** and **5** 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, "regulatory discards" can result; 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. In general, discarded fish are less likely to die if they are caught in shallow water.

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

In addition, **Alternative 1 (No action)** and **Alternative 5 (Preferred)** could also promote "high-grading" behavior. High-grading is a practice of selectively landing fish so that only the best quality (usually largest) fish are retained and 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.

Alternative 6 – Commercial trip limit

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 commercial season may exceed the commercial ACL. **Sub-Alternative 6c (Preferred)** would implement a 75 lb gw trip limit and is expected to slow harvest sufficiently such that the commercial ACL would not be exceeded.

Alternative 7 – Recreational bag limit

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 recreational fishing season may exceed the recreational ACL. Conversely, the bag limit proposed in **Alternative 7 (Preferred)** could result in beneficial effects by increasing the probability that the ACL would not be exceeded during the season. 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.

Economic Effects

Under **Alternative 1 (No Action)**, commercial harvest of red snapper would continue to be prohibited and thus landings and gross revenue would be zero in 2013 and for as long as the ACL was set at zero. In the recreational sector, private recreational anglers and for-hire vessels would still catch fish even with the prohibition in place, as illustrated by the fact that total mortalities (landings and discards) of 53,101 and 40,237 red snapper occurred in 2010 and 2011, respectively. Available data suggests recreational anglers and for-hire operators were adjusting to the prohibition on retention in 2010 as catch, catch effort, and target effort declined from 2009 to 2010 but declined further in 2011. Thus, assuming 2011 is more reflective of what is likely to occur in 2013 and beyond, if recreational anglers are not allowed to retain red snapper then the total expected consumer surplus in the recreational sector is expected to be $337,186.

> ***What is Consumer Surplus?***
>
> Consumer surplus measures consumer satisfaction. It is the difference between what consumers are willing to pay for a good or service relative to its market price.

Since **Sub-alternative 2a** factors in the most recent ABC and ABCs increase each year in the rebuilding projections, **Sub-alternative 2a** would generate a higher ACL relative to **Sub-alternatives 2b** and **2c (Preferred)**. Further, **Sub-alternative 2b** generates a higher ACL relative to **Sub-alternative 2c (Preferred)**. If this illustrates the expected relative size of the ACLs under each sub-alternative, the positive economic effects to the commercial sector and recreational sector relative to the status quo would be greatest in the short-term under **Sub-alternative 2a**, less under **Sub-alternative 2b**, and the least under **Sub-alternative 2c (Preferred)**.

Assuming red snapper would continue to rebuild at basically the same rate under each sub-alternative, the same would also be true with respect to long-term economic benefits.

It is not possible to determine with certainty if re-opening the harvest of red snapper would entice additional effort from the for-hire sector. However, it is unlikely the for-hire sector would undertake additional trips targeting red snapper, at least in the short-run, and thus net operating revenues (NOR) would not differ between **Sub-alternatives 2a**, **2b**, and **2c (Preferred)** or between these sub-alternatives and the status quo. 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 alternatives considered in this amendment (e.g., the one-fish bag limit under **Preferred Alternative 7**). Moreover, the relatively small ACLs and associated short recreational seasons under each of the sub-alternatives would significantly reduce incentives even further, particularly when combined with a one-fish bag limit. Nonetheless, benefits to anglers would increase on for-hire trips, as they would be allowed to keep their red snapper bag limit. In the event that for-hire trips actually increased in the long-term, for-hire vessels' NOR would be expected to increase, and the economic benefits to the recreational sector would therefore be increased.

An increase in the 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 pounds. There is always the possibility that some vessels may increase their target effort for red snapper, but the combination of any of the trip limits considered under **Alternative 6** in addition to the relatively low ACL suggests that the likelihood commercial red snapper target effort would increase is very low, at least in the short-term.

The economic benefits from allowing commercial harvest of red snapper may be highest if the red snapper season is opened in July, as would be the case under **Sub-alternative 3a (Preferred)**, than if it were opened in August (**Sub-alternative 3b**) or September (**Sub-alternative 3c**). Conversely, economic benefits may be the lowest if the season is opened in September (**Sub-alternative 3c**). Assuming catch and catch effort are reflective of when red snapper are relatively more available to the recreational sector, and that target effort reflects when red snapper are relatively most valued, then opening the season in July or August (**Sub-alternatives 4a (Preferred) and 4b**) would generate greater economic benefits to the recreational sector than if the recreational season opened in September (**Sub-alternative 4c**).

The economic effects of **Alternative 5 (Preferred)** are expected to be positive (i.e., reduction in trip costs) though relatively small for the commercial sector in the short-term. In the long-term, the reductions in trip costs would be expected to increase, at least for a time, as the stock recovers and ACLs are increased, though the magnitude of these effects will be dependent on whether a trip limit is selected under **Alternative 6**. In general, **Alternative 6** including **Sub-alternative 6c (Preferred)** would help in ensure the commercial ACL is not exceeded. Overages could require more stringent regulations (e.g., reductions in future year's ACLs and commercial quotas), in addition to prohibiting harvest of red snapper in the short-term on commercial vessels harvesting snapper grouper. In this respect, the long-term economic effects of this alternative may be considered positive. However, such effects will likely not differ across the four sub-alternatives.

The economic benefits in terms of additional red snapper consumer surplus under **Alternative 7 (Preferred)** cannot be estimated without knowing the recreational ACL. Thus, the economic benefits of **Alternative 7 (Preferred)** are dependent on the choice of sub-alternative under **Alternative 2** and whether targeting of red snapper will increase, as the latter would potentially affect red snapper catch per trip.

Social Effects

The decision to allow for the harvest of red snapper in South Atlantic waters is likely to have positive social effects, as the closure of this portion of the snapper grouper fishery was highly controversial. Public comment suggested that there were more red snapper than what was reflected in the stock assessment science. The temporary opening as a result of lower discards was likely perceived positively and may have had positive economic and social effects. **Alternative 1 (No action)** would keep current regulations, which do not allow any harvest, in place. Such action would likely be perceived negatively by stakeholders in both the commercial and recreational sectors as much of the public comment suggested that there would be negative social and economic impacts from the closure initially. Furthermore, because there was a temporary seasonal opening during the 2012-fishing year, stakeholders might expect similar action in years to follow. Because of the economic downturn, fishing businesses and individuals are experiencing economic stress that could be negatively affected by slight disruptions in revenues or positively affected by increases in that revenue.

By allowing an ACL for red snapper in **Alternative 2, Sub-Alternative 2c (Preferred)**, there should be positive social effects as it is more conservative and should have a positive effect on stocks that could have a longer term positive social effect as stocks rebuild. Unfortunately, we are unable to calculate any real short term social effects from the lower or even 0 ACLs that might result. If the economy is recovering, then it might be assumed that the short term negative effects from lower ACLs could be outweighed by the longer term positive effects of conservation. Yet, if fishing businesses are not recovering as well, they may not see the positive effects in the long term.

Establishing a season for the commercial sector as an accountability measure under **Alternative 3, Sub-alternatives 3a (Preferred)** is likely to have few social effects other than to ensure that the ACL is not exceeded, which should be positive. As mentioned above, derby fishing is possible, but for the commercial sector, it may not be as problematic if they do not target red snapper and only retain incidentally caught fish. As for the recreational sector under **Alternative 4** with its **Sub-Alternatives 4a (Preferred)** there should also be positive social effects. Again, the alternative that offers the most positive social effects may depend on where a stakeholder may reside with regard to a preferred opening date. Overall, the accountability measure should have positive social effects as some method for curtailing overages is in place and can ensure a more viable stock in the future.

The suspension of the minimum size limit under **Alternative 5 (Preferred)** should also have positive social effects as it removes the tendency for regulatory discards to occur. The fewer opportunities for regulatory discards to occur is a positive social effect by allowing fishermen to keep fish that might die even if not kept.

Establishment of a 75 lb gw commercial trip limit (**Sub-Alternative 6c (Preferred)**) would have positive social effects for the commercial fishery by helping ensure the commercial ACL is not exceeded. Overages could require more stringent regulations (e.g., reductions in future year's ACLs and commercial quotas), in addition to prohibiting harvest of red snapper in the short-term on commercial vessels harvesting snapper grouper. In this respect, the long-term social effects of this alternative may be considered positive. However, such effects will likely not differ across the four sub-alternatives.

The establishment of a one fish bag limit with **Alternative 7 (Preferred)** would have a positive effect for recreational fishermen by extending the recreational season. Without a bag limit, a derby fishery could develop within the recreational sector that could substantially shorten the open season. Yet, a one fish bag limit can also contribute to regulatory discards as fishermen keep larger fish and discard smaller ones. How much this might occur in the red snapper recreational sector is unknown at this time and the overall effects should be positive from this alternative when combined with the others.

The overall social effects from these actions should be positive as the Council is attempting to be proactive in response to changes in ABC. This should give those who depend on this species some added revenues as the stock rebuilds.

Because there would be no opportunities for harvest, it is assumed that **Alternative 1 (No Action)** would have negative social effects both tangible and perceptually.

Administrative

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.

Chapter 1.
Introduction

1.1 What Actions Are Being Proposed?

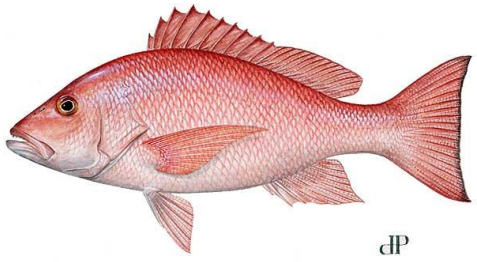
The harvest and possession of red snapper was prohibited on January 4, 2010. In 2012, fishery managers allowed limited harvest of red snapper using a temporary rule through emergency action under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). Through this amendment, managers are establishing a process to determine future annual catch limits (ACLs) and fishing seasons for red snapper in the South Atlantic similar to the season established in 2012.

1.2 Who is Proposing the Actions?

The South Atlantic Fishery Management Council (South Atlantic Council) is proposing the actions. The South Atlantic Council recommends management measures and submits them to the National Marine Fisheries Service (NMFS) who ultimately approves, disapproves, or partially approves, and implements the actions in the amendment through the development of regulations on behalf of the Secretary of Commerce. NMFS is an agency in the National Oceanic and Atmospheric Administration within the Department of Commerce.

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 NMFS; and 4 non-voting members
- Responsible for developing fishery management plans and amendments under the Magnuson-Stevens Act; recommends actions to NMFS 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 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.

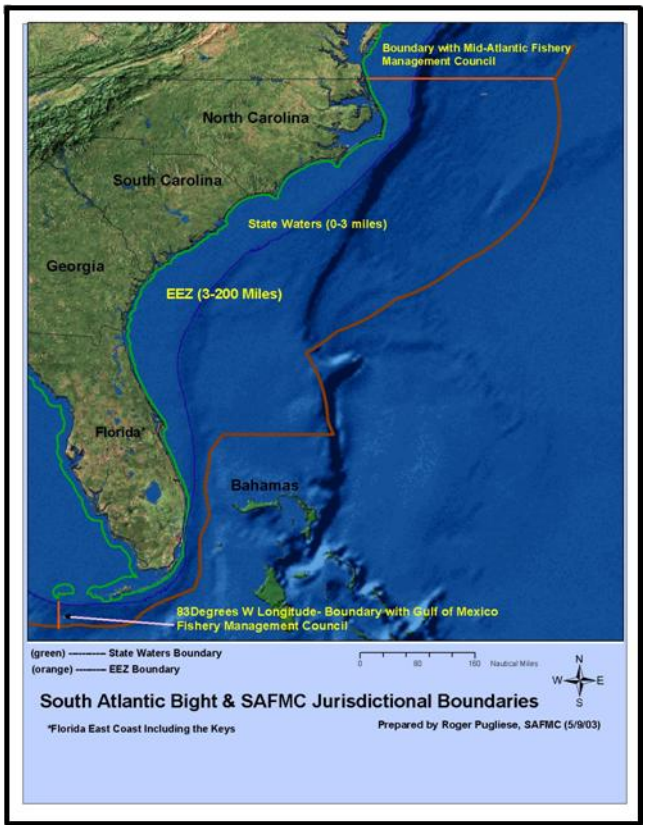


Figure 1-1. Jurisdictional boundaries of the South Atlantic Fishery Management Council.

1.4 Why are the Council and NMFS Considering Action?

The South Atlantic Council and NMFS have determined that retention of a limited number of red snapper beginning in 2013, along with appropriate management controls, would not jeopardize the rebuilding of the red snapper stock if the ACL is not exceeded the previous year. For the 2012 fishing season, the South Atlantic Council and NMFS 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. Similarly, the South Atlantic Council and NMFS have determined that future fishing seasons may occur following a comparison of allowable mortality levels and mortality (retention and discards) in past years.

Purpose for Action

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

Need for Action

Increase the socio-economic benefits 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 ACL, and (3) discard mortality of red snapper. In addition, the fishing season should allow an opportunity to collect 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 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 specify the total ACL for the red snapper stock in the South Atlantic beginning in 2013. In 2012, the ACL was 13,067 fish; if no action is taken, the ACL in 2013 and beyond would be zero (landings only). If an ACL is implemented, the total ACL would be 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).

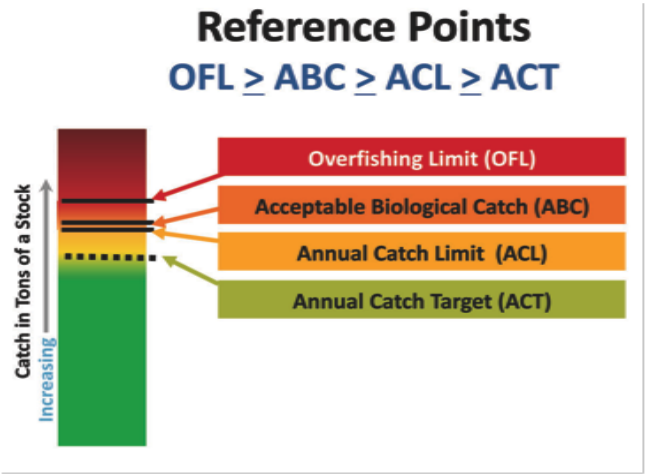


Figure 1-2. The relationship of the reference points to each other.

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 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 (i.e., 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 (64,000 fish) for 2011, 541,000 lbs ww (86,000 fish) for 2012, and 611,000 lbs ww (96,000) fish in 2013 (**Table 1-1**). 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 (2010) to match a pronounced increase in headboat catch per unit effort (CPUE) was considered a key point in the assessment.

Table 1-1. Projection results (expected values)/ABCs with F=0.98XF_{30}, extended from assessment model configuration with component weights as in the AW report, but headboat index weight increased to 0.30.

	Discard Mortalities (1000 fish)	Landings (1000 fish)	Total (1000 fish)
2012	41	45	86
2013	44	52	96
2014	47	59	106
2015	50	64	114
2016	52	69	121
2017	54	74	128
2018	56	79	135
2019	58	84	142

1.6 What is the History of Management for Red Snapper?

Red snapper regulations in the South Atlantic where first implemented in 1983. See **Appendix F** for a detailed history of management for the snapper grouper fishery. Recent actions since the first SEDAR assessment in 2008 (SEDAR 15 2008) are summarized in **Figure 1-3**.

The South Atlantic Council received notice in 2008 that the red snapper stock in the South Atlantic was undergoing overfishing and overfished as determined by SEDAR 15 (2008). The South Atlantic Council developed Amendment 17A to the Fishery Management Plan for the Snapper-Grouper Fishery of the South Atlantic Region (Amendment 17A) to end overfishing and begin rebuilding the stock. More specifically, the actions in Amendment 17A (SAFMC 2010a) included a harvest prohibition for red snapper and a snapper-grouper area closure. The area closure was 4,827 square miles and extended from southern Georgia to northern Florida where harvest and possession of all snapper-grouper species would be prohibited (except when fishing with black sea bass pots or spearfishing gear for species other than red snapper). The red snapper prohibition was effective on January 3, 2011; however, NMFS delayed the effective date of the area closure until June 1, 2011, via an emergency rule, to allow time to review the results of a new red snapper stock assessment (SEDAR 24 2010).

The results of SEDAR 24 showed red snapper to be overfished and undergoing overfishing; however, the rate of overfishing found in SEDAR 24 was less than the rate of overfishing found in the previous stock assessment (SEDAR 15). Based on the results from SEDAR 24, evidence of decreased effort in the recreational sector, and recommendations from their SSC, the South Atlantic Council determined that the snapper-grouper area closure approved in Amendment 17A, in addition to the harvest prohibition, was more conservative than what was necessary to end red snapper overfishing. As a result, at their December 2010 meeting, the South Atlantic Council approved Regulatory Amendment 10 to the Fishery Management Plan for the Snapper-Grouper Fishery of the South Atlantic Region (Regulatory Amendment 10; SAFMC 2011a) for review by the Secretary of Commerce by a unanimous vote. The action in Regulatory Amendment 10 was an elimination of the snapper-grouper area closure approved in Amendment 17A. Regulatory Amendment 10 was effective on May 31, 2011.

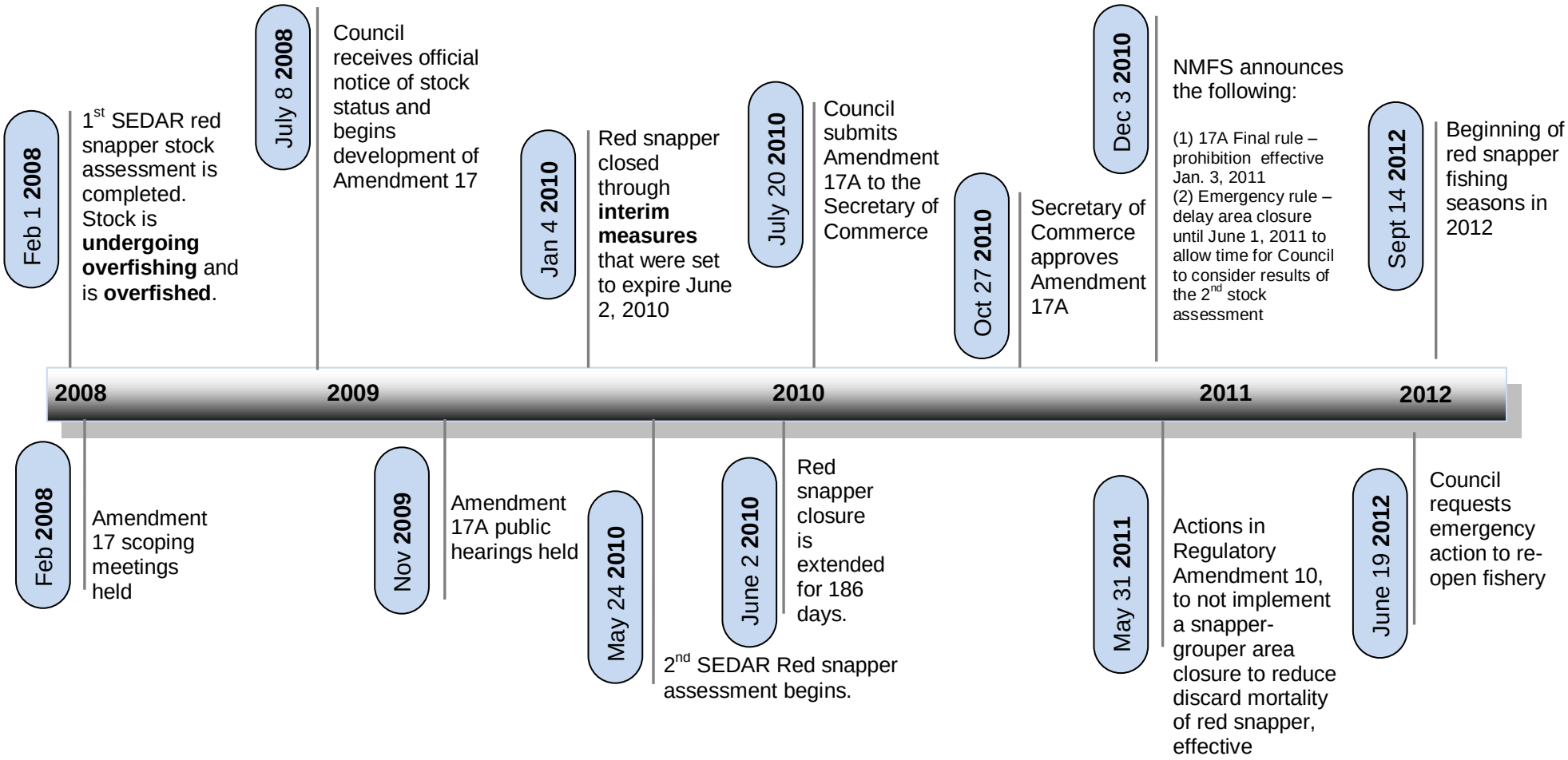


Figure 1-3. Timeline of recent red snapper management measures.

Chapter 2. Proposed Action and Alternatives

2.1 Alternatives for Red Snapper ACLs, AMs, and Fishing Seasons

Alternative 1 (No Action). Outside of the 2012 fishing season summarized below, the red snapper annual catch limit (ACL) is zero (landings only), and 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 is 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 are as follows:

(1) Track catch per unit effort (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.
(4) During the closed seasons, the recreational and commercial ACLs are zero (landings only).

2012 Fishing Season

In 2012, a temporary red snapper season was established. The commercial and recreational ACLs for 2012 were 20,818 lbs gutted weight (gw) and 9,399 fish, respectively. The commercial red snapper season opened at 12:01 a.m., local time, on September 17, 2012, and closed at 12:01 a.m., local time, on September 24, 2012. During the open commercial season, the daily trip limit was 50 lbs gw and there was no minimum size limit for red snapper. Because the commercial ACL was not met, commercial harvest of red snapper reopened for 8 days beginning November 13, 2012, and for 7 days beginning December 6, 2012.

The recreational fishing season was open for two consecutive weekends made up of Fridays, Saturdays, and Sundays. The recreational red snapper season opened at 12:01 a.m., local time, on September 14, 2012, and closed at 12:01 a.m., local time, on September 17, 2012; the season then reopened at 12:01 a.m., local time, on September 21, 2012, and closed at 12:01 a.m., local time, on September 24, 2012. During the open recreational season, the bag limit was one fish per person per day and there was no minimum size limit for red snapper. The temporary commercial AM was the specification of the length of the opening and other management controls (trip limit), the monitoring of landings, and the comparison of the landings to the ACL before potentially re-opening in 2012. The temporary recreational AM was the specification of the length of the opening and other management controls (bag limit).

The total ACL (in numbers of fish) was based on the following formula:

$$ACL_{yr} = ABC_{yr} - (estCSR_{yr-2} + estCSR_{yr-1} + ABC_{yr})/3$$

where ACL_{yr} equals the ACL in the current fishing year, ABC_{yr} equals the acceptable biological catch approved by the Scientific and Statistical Committee (SSC) for the current fishing year, and *estCSR* is the estimated closed season removals, computed as the estimated dead discards plus closed season landings during the previous fishing years.

Alternative 2. Annually establish the red snapper total ACL (in numbers of fish) and sector ACLs based upon South Atlantic Fishery Management Council (South Atlantic Council) pre-approved formulas. Establish commercial and recreational AMs as in-season closures based on pre-season or in-season ACL projections. If the total ACL is exceeded in a given year, then harvest would not be allowed in the following fishing year.

Sub-alternative 2a. Annually establish the total ACL (in numbers of fish) based on the formula used to determine the ACL in 2012 as done through the temporary rule through emergency action.

$$\textbf{\textit{If total removals}}_{yr-1} > \textbf{\textit{ABC}}_{yr-1}\textbf{\textit{, then ACL}}_{yr} = 0$$

$$\textbf{\textit{If total removals}}_{yr-1} < \textbf{\textit{ABC}}_{yr-1}\textbf{\textit{, then }} \quad ACL_{yr} = ABC_{yr} - (estCSR_{yr-2} + estCSR_{yr-1} + ABC_{yr})/3$$

where ACL_{yr} equals the ACL in the current fishing year, ABC_{yr} equals the acceptable biological catch (ABC) approved by the SSC for the current fishing year, and *estCSR* equals the estimated dead discards plus landings during the previous fishing years.

If the ABC in the prior fishing year was exceeded, then the ACL in the following year would be set equal to zero.

The ACL would be computed by first averaging estimated dead discards for the two prior fishing years with projected mortalities from the current year ABC. Average mortalities would then be subtracted from the current fishing year ABC to estimate the ACL. If the ACL is calculated as a negative number, then the ACL would be set equal to zero.

Sub-alternative 2b. Annually establish the total ACL (in numbers of fish) based on the following formulas:

$$\textbf{\textit{If total removals}}_{yr-1} > \textbf{\textit{ABC}}_{yr-1}\textbf{\textit{, then ACL}}_{yr} = 0$$

$$\textbf{\textit{If total removals}}_{yr-1} < \textbf{\textit{ABC}}_{yr-1}\textbf{\textit{, then }} ACL_{yr} = ((ABC_{yr-1} - estCSR_{yr-1})/ABC_{yr-1}) \times ABC_{yr}$$

where ACL_{yr} equals the ACL in the current fishing year, ACL_{yr-1} and ABC_{yr-1} equals the ACL and ABC for the prior fishing year, and $estCSR_{yr-1}$ equals the estimated dead discards plus landings during the prior year.

If the ABC in the prior fishing year is exceeded, then the ACL in the following year would be set equal to zero.

The ACL would be computed by subtracting the previous year's estimated removals from the previous year's ABC, then dividing by the previous year's ABC. The resulting ratio would be multiplied by the current fishing year ABC to estimate the ACL.

Sub-alternative 2c (Preferred). Annually establish the total ACL (in numbers of fish) based on the following formulas:

$$\textit{If total removals}_{yr-1} > ABC_{yr-1}\textit{, then } ACL_{yr} = 0$$

$$\textit{If total removals}_{yr-1} < ABC_{yr-1}\textit{, then } ACL_{yr} = \left(\frac{ABC_{yr-2} - estCSR_{yr-2}}{ABC_{yr-2}} + \frac{ABC_{yr-1} - estCSR_{yr-1}}{ABC_{yr-1}}\right)/2 \times ABC_{yr}$$

where ACL_{yr} equals the ACL in the current fishing year, ACL_{yr-n} and ABC_{yr-n} equals the ACL and ABC for the prior fishing years, and $estCSR_{yr-n}$ equals the estimated dead discards plus landings in the prior fishing years.

If the ABC in the prior fishing year is exceeded, then the ACL in the following year would be set equal to zero.

The ACL would be computed in a similar manner as **Sub-Alternative 2b**, but would include two years of estimated removals rather than one.

Note: Sector ACLs will be calculated through the established allocations for red snapper (28.07% commercial; 71.93% recreational).

Alternative 3. Establish commercial fishing seasons. NMFS will announce the commercial ACL and the opening of the fishing season through the *Federal Register* and other methods deemed appropriate. The end of the commercial red snapper season will close when the sector ACL is met or projected to be met. Commercial landings will be monitored by the SEFSC's quota monitoring program. The commercial fishing season will not open if the projected season length is three days or less.

Sub-alternative 3a (Preferred). The commercial season will begin at 12:01 A.M. on the second Monday in July.

Sub-alternative 3b. The commercial season will begin at 12:01 A.M. on the first Monday in August.

Sub-alternative 3c. The commercial season will begin at 12:01 A.M. on the second Monday in September.

Note: The operator of a vessel with red snapper in excess of the bag or possession limit aboard must have landed such red snapper prior to 12:01 a.m., local time, on the day following the closure, and all sale or purchase of red snapper must occur prior to 12:01 a.m., local time, on the day following the closure. The prohibition on sale or purchase does not apply to sale or purchase of red snapper that were harvested, landed ashore, and sold prior to 12:01 a.m., local time, on the day following the closure, and were held in cold storage by a dealer or processor.

In addition, the NMFS Regional Administrator has the authority to delay the opening of red snapper fishing seasons in the event of a tropical storm or hurricane affecting the South Atlantic Council's area of authority.

Alternative 4. Establish recreational fishing seasons. SERO will complete an analysis each year estimating the length of the recreational red snapper fishing season. NMFS will announce the recreational ACL and the opening of the fishing season through the *Federal Register* and other methods deemed appropriate. The recreational season will consist of weekends only (Friday, Saturday, Sunday). The end of the recreational red snapper season will be pre-determined and announced before the start of the recreational season. The recreational fishing season will not open if the projected season length is three days or less.

Sub-alternative 4a (Preferred). The recreational season will begin at 12:01 A.M. on the second Friday in July.

Sub-alternative 4b. The recreational season will begin at 12:01 A.M. on the first Friday in August.

Sub-alternative 4c. The recreational season will begin at 12:01 A.M. on the second Friday in September.

Alternative 5 (Preferred). Eliminate the red snapper commercial and recreational 20-inch TL minimum size limit.

Alternative 6. Establish a red snapper commercial trip limit.

Sub-alternative 6a. Establish a red snapper commercial trip limit of 25 lbs gw per trip.

Sub-alternative 6b. Establish a red snapper commercial trip limit of 50 lbs gw per trip.

Sub-alternative 6c (Preferred). Establish a red snapper commercial trip limit of 75 lbs gw per trip.

Sub-alternative 6d. Establish a red snapper commercial trip limit of 100 lbs gw per trip.

Alternative 7 (Preferred). Establish a red snapper recreational bag limit of one fish per person per day.

A Description of How the Proposed Process Would Work

The acceptable biological catch (ABC) for 2012 was 86,000 fish. Estimated landings and dead discards that occurred in 2012 will be available around March 2013. If NMFS determines that the estimated landings and dead discards that occurred in 2012 are equal to or greater than 86,000 fish, no harvest would be allowed in 2013.

If NMFS determines that the estimated landings and dead discards that occurred in 2012 is less than 86,000 fish, harvest *may* be allowed in 2013. (Note: The commercial fishing season and the recreational fishing seasons would not open if their 2013 projected season length is three days or less.)

The 2013 ABC is from rebuilding projections contained in Table 9c of a document titled "SEDAR-24 South Atlantic Red Snapper: Management quantities and projections requested by the SSC and SERO" and in Table 1-1 of this document. The 2013 ABC equals 96,000 fish. NMFS would calculate the total ACL as per the formula implemented thorough this amendment and the sector-ACLs as per the South Atlantic Fishery Management Council's (South Atlantic Council) allocation formula. NMFS would project the length of the commercial and recreational fishing seasons.

If harvest is allowed, NMFS would announce the pre-determined commercial and recreational fishing year start dates. The end of the commercial red snapper season would close when the commercial sector ACL is met or projected to be met. The end of the recreational red snapper season would be projected and announced before the start of the recreational season. The NMFS Regional Administrator has the authority to delay the opening of red snapper fishing seasons in the event of a tropical storm or hurricane affecting the South Atlantic Council's area of authority.

The process would be repeated each year unless modified.

2.2 Comparison Effects Summary of Alternatives

This section describes the environmental effects of these alternatives through concise descriptive summary of such impacts in a comparative form (**Table 2-1**). Chapter 4 describes the effects in detail.

Table 2-1. A summary and comparison of the effects of the alternatives.

Alternatives		Effects			
		Biological	**Economic**	**Social**	**Administrative**
1	In 2012, ACL=13,067 fish (20,818 lbs comm.2/9,399 fish rec). In 2013, ACL = 0 (landings) and prohibition.	+ direct to red snapper + indirect to associated species	Consumer surplus=$337,186 (recreational sector)	-No allowable harvest	No change
2	Computing ACL				
2a	Equation 1: 2012 Temporary Rule Method	+/-Allows mortality but would be within scientific recommendations.[1]	+Overall Greatest of sub-alts (short-term)	+Overall Greatest of sub-alts	-Rule-making, data monitoring, outreach, and enforcement
2b	Equation 2: Previous Year Ratio Method		+Overall	+Overall	
2c	(**Preferred**). Equation 3: Two Previous Years Ratio Method		+Overall Least of sub-alts (short-term) Greatest of sub-alts (long-term)[2]	+Overall greatest of sub-alts	
3	Commercial fishing season				
3a	(**Preferred**). Begins 12:01 AM on 2nd Monday in July	No difference	+Overall Higher than sub-alt 3b and 3c	+Overall	-Rule-making, data monitoring, outreach, and enforcement
3b	Begins 12:01 AM on 1st Monday in August	No difference	+Overall	+Overall	
3c	Begins 12:01 AM on 2nd Monday in September	Bycatch of vermilion could be higher than other sub-alts	+Overall	+Overall	
4	Recreational fishing season				
4a	(**Preferred**). Begins 12:01 AM on 2nd Friday in July	No difference among sub-alts	+Overall Higher than sub-alt 4c	+Overall	-Rule-making, data monitoring, outreach, and enforcement
4b	Begins 12:01 AM on 1st Friday in August	No difference among sub-alts	+Overall Higher than sub-alt 4c	+Overall	
4c	Begins 12:01 AM on 2nd Friday in September	No difference among sub-alts	+Overall	+Overall	

Alternatives		Effects			
		Biological	**Economic**	**Social**	**Administrative**
5	(**Preferred**). Eliminate 20-inch total length (TL) minimum size limit	+Fish released -High-grading	+Consumer surplus higher for kept fish -High-grading		-Rule-making, data monitoring, outreach, and enforcement
6	Commercial trip limit				
6a	25 lbs gutted weight (gw)	+Constrain harvest -High-grading	+Allow harvest	+Allow harvest	-More enforcement
6b	50 lbs gw	+Constrain harvest -High-grading	+Allow harvest	+Allow harvest	
6c	(**Preferred**). 75 lbs gw	+Constrain harvest -High-grading	+Allow harvest	+Allow harvest	
6d	100 lbs gw	+Constrain harvest -High-grading	+Allow harvest; highest of sub-alts (short-term)	+Allow harvest; highest of sub-alts -Fishery might close earlier	
7	(**Preferred**). Recreational bag limit of 1 fish per person per day	+Constrain harvest -High-grading	+Allowing harvest; dependent on choice of ACL	+Allowing harvest	-More enforcement

[1]Degree of impacts dependent on degree of high-grading.
[2]This conclusion must be cautioned because, based on quantitative estimates in the example, this sub-alternative may generate an ACL of zero.

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, sea grass beds, and rocky hard-bottom substrates

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

  Examples include populations of red snapper, corals, and 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 South Atlantic Fishery Management Council's (South Atlantic Council) 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.

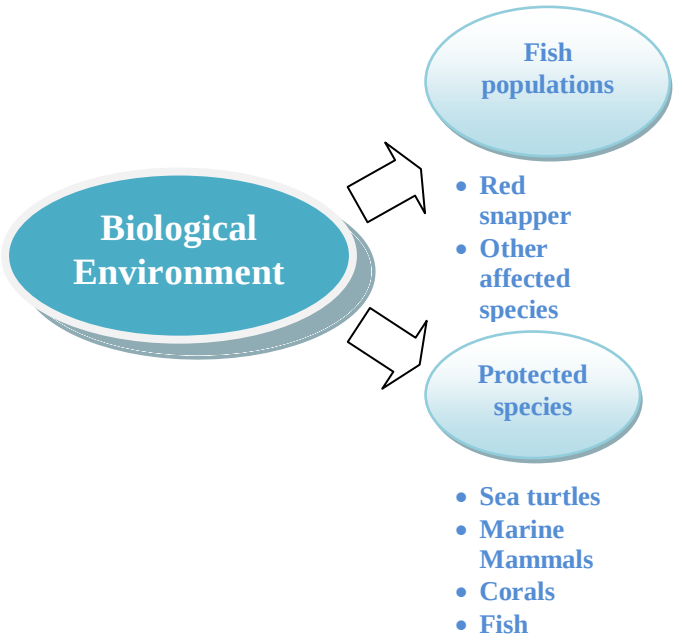


Figure 3-1. Two components of the biological environment described in this document.

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" nor "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).**

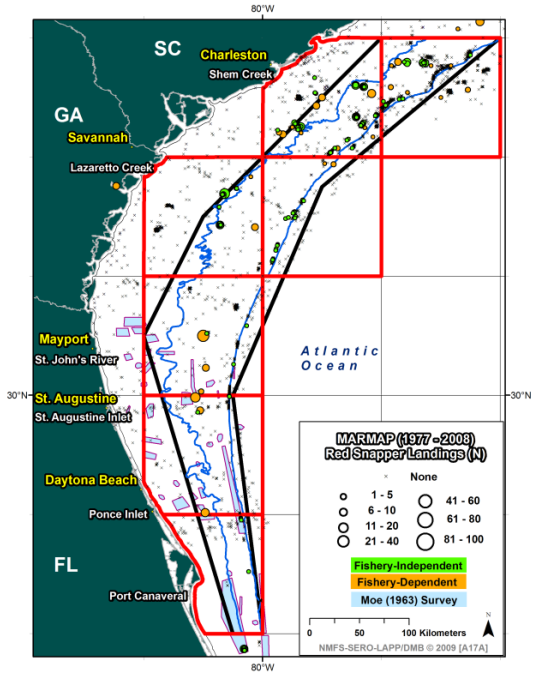
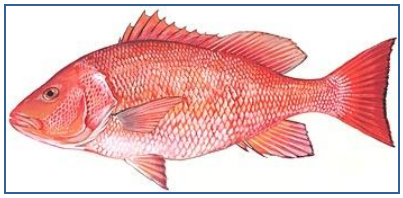


Figure 3-2. Distribution of red snapper taken by MARMAP in fishery-independent and fishery-dependent samples as well as locations where Moe (1963) reported red snapper.

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 Southeast Data, Assessment, and Review (SEDAR) 24 (2010) based on the Hoenig (1983) method is 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,

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

cephalopods, and some planktonic items (Szedlemayer and Lee 2004).

Among red snapper, larger fish are not 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 33.5 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 NMFS 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 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 SSC specifies the overfishing level (OFL) and applies the ABC control rule to determine the ABC.

The results of SEDAR 24, utilizing the most recent data from 2009, determined that the red snapper stock is undergoing overfishing and is overfished **(Table 3-1).** The South Atlantic Council, through Amendments 17A Snapper Grouper FMP (SAFMC 2010a) and Regulatory Amendment 10 to the Snapper Grouper FMP (SAFMC 2011a), 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.

Status	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 Meeting 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 ACLs shown in this amendment are based on an ABC of 541,000 lbs whole weight (86,000 fish) in 2012. The actual ACL for 2013 will be calculated using the 2013 ABC of 96,000 fish.

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)**. Mortality estimates from the 2012 limited season are not yet available.

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

Sector		2010	2011
For-hire	Landed	971	1,950
	Discard mortalities	20,569	22,131
Private recreational	Landed	0	0
	Discard mortalities	31,561	16,156
Commercial	Landed	0	0
	Discard mortalities	18,293	21,169

3.2.5 Other Fish Species Affected

In addition to red snapper, snapper grouper species most likely to be affected by the proposed action 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 the top five species most associated with red snapper in the South Atlantic (NMFS 2011). Amendment 17A to the Snapper Grouper FMP (SAFMC 2010a) describes their life history characteristics in detail in **Section 3.2.1** and is incorporated herein by reference.

gag
(*Mycteroperca microlepis*)

greater amberjack
(*Seriola dumerili*)

red porgy
(*Pagrus pagrus*)

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 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; two *Acropora* coral species (elkhorn [*Acropora palmata*] and staghorn [*A. cervicornis*]), and five distinct population segments (DPS) of Atlantic sturgeon are protected under the ESA. **Section 3.5** of Amendment 17A to the Snapper Grouper FMP (SAFMC 2010a), describes the life history characteristics in detail for all these species other than Atlantic sturgeon. Below is a brief description of the life history characteristics for the DPSs of Atlantic sturgeon. The potential impacts from the continued authorization of the South Atlantic snapper-grouper fishery on all ESA-listed species have been considered in previous ESA Section 7 consultations. Summaries of those consultations and their determination are in **Appendix G**.

Five separate DPSs of the **Atlantic sturgeon** (*Acipenser oxyrinchus oxyrinchus*) were listed under the ESA effective April 6, 2012 (76 FR 5914; February 12, 2012). From north to south, the DPSs are the Gulf of Maine, New York Bight, Chesapeake Bay, Carolina, and South Atlantic (**Figure 3-3**). The New York Bight, Chesapeake Bay, Carolina, and South Atlantic DPSs are listed as endangered, and the Gulf of Maine DPS is listed as threatened. The five DPSs were listed under the ESA as a result of threats from a combination of habitat curtailment and modification, overutilization (i.e., being taken as bycatch) in commercial fisheries, and the inadequacy of regulatory mechanisms in ameliorating these impacts and threats.

Note: The references in the following section are included in Snapper Grouper Regulatory Amendment 15 (SAFMC 2013) and are incorporated herein by reference.

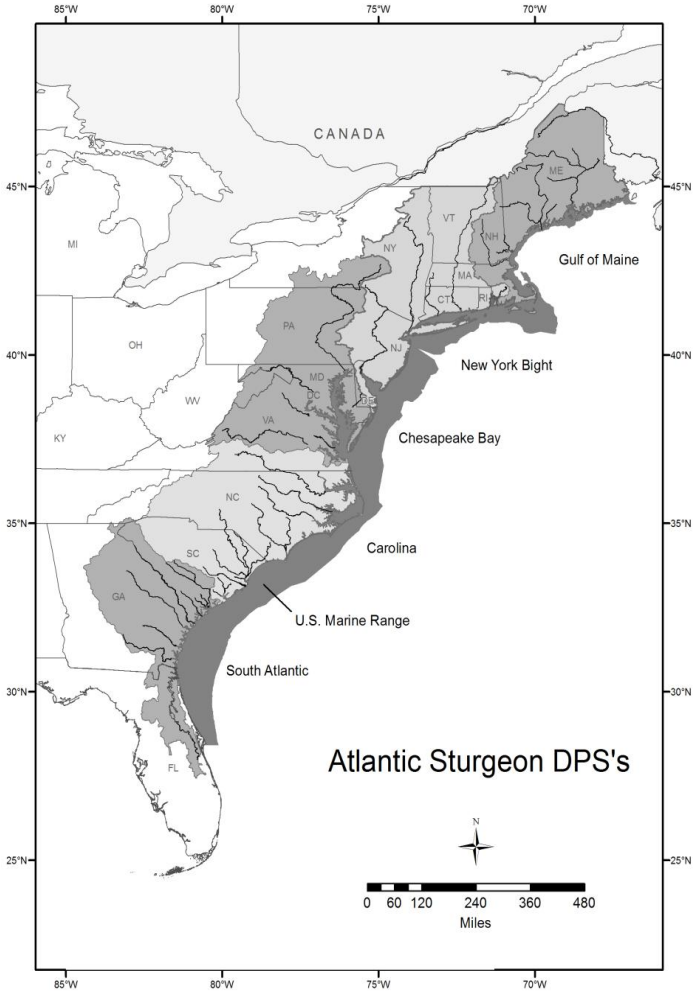


Figure 3-3. Map depicting the five DPSs of Atlantic sturgeon.

Atlantic sturgeon are long-lived, estuarine dependent, anadromous[1] fish (Bigelow and Schroeder 1953, Vladykov and Greeley 1963, Mangin 1964, Pikitch et al. 2005, Dadswell 2006, ASSRT 2007) that historically occurred from Labrador south to the St. Johns River, Florida. Generally, Atlantic sturgeon use coastal bays, sounds, and ocean waters in depths less than 132 ft (Vladykov and Greeley 1963, Murawski and Pacheco 1977, Dovel and Berggren 1983, Smith 1985, Collins and Smith 1997, Welsh et al. 2002, Savoy and Pacileo 2003, Stein et al. 2004, USFWS 2004, Laney et al. 2007, Dunton et al. 2010, Erickson et al. 2011, Wirgin and King 2011) where they feed on a variety of benthic invertebrates and fish (Bigelow and Schroeder 1953, ASSRT 2007, Guilbard et al. 2007, Savoy 2007). Mature Atlantic sturgeon make spawning migrations from estuarine waters to rivers as water temperatures reach 43ºF for males (Smith et al. 1982, Dovel and Berggren 1983, Smith 1985, ASMFC 2009) and 54ºF for females (Dovel and Berggren 1983, Smith 1985, Collins et al. 2000a), typically between February (southern systems) and July (northern systems). Individuals spawn at intervals of once every 1-5 years for males and once every 2-5 years for females. Spawning is believed to occur in flowing water between the salt front of estuaries and the fall line of large rivers, when and where optimal flows are 18-30 in/s and depths are 36-89 ft (Borodin 1925, Dees 1961, Leland 1968, Scott and Crossman 1973, Crance 1987, Shirey et al. 1999, Bain et al. 2000, Collins et al. 2000a, Caron et al. 2002, Hatin et al. 2002, ASMFC 2009). Females may produce 400,000 to 4 million eggs per spawning year (Vladykov and Greeley 1963, Smith et al. 1982, Van Eenennaam et al. 1996, Van Eenennaam and Doroshov 1998, Stevenson and Secor 1999, Dadswell 2006) and deposit eggs on hard bottom substrate such as cobble, coarse sand, and bedrock (Dees 1961, Scott and Crossman 1973, Gilbert 1989, Smith and Clugston 1997, Bain et al. 2000, Collins et al. 2000a, Caron et al. 2002, Hatin et al. 2002, Mohler, 2003, ASMFC 2009). Upon hatching, studies suggest that early juvenile Atlantic sturgeon (age-0 [i.e., YOY], age-1, and age-2) remain in low salinity waters of their natal estuaries (Haley 1999, Hatin et al. 2007, McCord et al. 2007, Munro et al. 2007) for months to years before emigrating to open ocean as subadults (Holland and Yelverton 1973, Dovel and Berggen 1983, Waldman et al. 1996, Dadswell 2006, ASSRT 2007). Growth rates and age at maturity are both influenced by water

[1] Anadromous refers to a fish that is born in freshwater, spends most of its life in the sea, and returns to freshwater to spawn (NEFSC FAQ's, available at http://www.nefsc.noaa.gov/faq/fishfaq1a.html, modified June 16, 2011)

temperature, as Atlantic sturgeon grow larger and mature faster in warmer waters. Atlantic sturgeon may live up to 60 years, reach lengths up to 14 feet and weigh over 800 lbs. Tagging studies and genetic analyses (Wirgin et al. 2000, King et al. 2001, Waldman et al. 2002, ASSRT 2007, Grunwald et al. 2008) indicate that Atlantic sturgeon exhibit ecological separation during spawning throughout their range that has resulted in multiple, genetically distinct, interbreeding population segments.

The construction of dams, dredging, and modification of water flows have reduced the amount and quality of habitat available for Atlantic sturgeon spawning and foraging. Water quality (temperature, salinity, and dissolved oxygen) has also been reduced by terrestrial activities, leading to further declines in available spawning and nursery habitat. Although spawning historically occurred within many Atlantic coast rivers, only 16 U.S. rivers are known to currently support spawning based on available evidence (i.e., presence of YOY or gravid Atlantic sturgeon documented within the past 15 years) (ASSRT 2007).

Overutilization of Atlantic sturgeon from directed fishing caused initial severe declines in Atlantic sturgeon populations in the Southeast, from which they have never recovered. Although directed harvest of this species has ceased, Atlantic sturgeon continue to be incidentally caught as bycatch in other commercial fisheries. Because Atlantic sturgeon mix extensively in marine waters and may utilize multiple river systems for nursery and foraging habitat, in addition to their natal spawning river, they are subject to being caught in multiple fisheries throughout their range. Additionally, Atlantic sturgeon are more sensitive to bycatch mortality because they are a long-lived species, have an older age at maturity, have lower maximum fecundity values, and a large percentage of egg production occurs later in life. Based on these life history traits, Boreman (1997) calculated that Atlantic sturgeon can only withstand the annual loss of up to 5% of their population to bycatch mortality without suffering population declines. Mortality rates of Atlantic sturgeon taken as bycatch in various types of fishing gear range between 0-51%, with the greatest mortality occurring in sturgeon caught by sink gillnets. While many threats to Atlantic sturgeon have been ameliorated or reduced due to existing regulatory mechanisms, such as the moratorium on directed fisheries for Atlantic sturgeon, bycatch is currently not being addressed through existing mechanisms.

The recovery of Atlantic sturgeon along the Atlantic Coast, especially in areas where habitat is limited and water quality is severely degraded, will require improvements in the following areas: (1) elimination of barriers to spawning habitat either through dam removal, breaching, or installation of successful fish passage facilities; (2) operation of water control structures to provide appropriate flows, especially during spawning season; (3) imposition of dredging restrictions including seasonal moratoriums and avoidance of spawning/nursery habitat; and (4) mitigation of water quality parameters that are restricting sturgeon use of a rivers (i.e., DO). Stronger regulatory mechanisms may likely aid in achieving these improvements. These regulatory mechanisms may also aid in reducing bycatch mortality in commercial fisheries, again assisting in the recovery of the species.

3.3 Socio-economic Environment

3.3.1 Economic Description of the Commercial Sector

A recent description of the commercial component of the snapper grouper fishery is contained in Amendment 17A (SAFMC 2010a) and Regulatory Amendment 10 (SAFMC 2011a)

and is incorporated herein by reference. The following provides a brief summary, some key highlights, and updated information, where available. Amendment 17A expressed real dollars in terms of 2007 dollars while Regulatory Amendment 10 used 2008 dollars. For the current update, 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 (2010a) contains numerous average annual (2003-2007) commercial sector performance statistics. In general, these statistics illustrate that ex-vessel revenue and landings fluctuate in the same direction, which suggests that ex-vessel demand is price elastic. The policy implication is that regulations that reduce industry landings in the short-term are expected to reduce ex-vessel revenue in the short-term. Conversely, ex-vessel revenue is expected to increase over time if regulations successfully increase biomass and landings. Updates of all these statistics through 2011 are not available, in part because the fishery was closed in 2010 and 2011. Select statistics updated through 2011 are provided in the following paragraphs.

SAFMC (2010a) 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 are 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 approximately 121,000 lbs valued at $421,000. Because harvest and sale of red snapper has been prohibited since 2010, only the 2008 and 2009 landings and revenues may be

updated. For these two years, red snapper landings averaged about 309,000 lbs valued at $1.01 million. 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 approximately $612,000 (2008 dollars).

With respect to seasonality, although the seasonal distribution of landings varied during 1993-2007, landings tended to be highest in May and lowest in September. During the 5-year period from 2003-2007, landings were above average from March through June, below average in August and September, and about average between October and February when compared to a uniform distribution of landings throughout the year. This pattern changed to some degree in 2008 and 2009. Although the lowest landings still occurred in September, landings peaked in December and were highest in the last quarter (October through December) of those years and were relatively high from June through August, but landings in the early months of the year (January through May) represented a much smaller proportion of the annual landings than in previous years. This seasonal pattern change could have been at least partly driven by changes in fishermen behavior induced by the impending development of management measures for red snapper (i.e., closure of the fishery in 2010) as well as the closure of vermilion snapper to commercial harvest in September for 2009.

In addition, SAFMC (2010a) does not contain any information regarding seasonal patterns in the price of red snapper. From 2005-2009, the nominal price of red snapper did vary somewhat from month to month, ranging from a high in April of $3.61 per pound to a low of $3.41 per pound in January. Average prices in July, August, and September were $3.46, $3.42, and $3.53, respectively. Data from 2009, the most recent year of commercial harvest, also indicate that the nominal price of red snapper did vary somewhat from month to month, ranging from a high in April of $3.73 per pound to a low of $3.52 per pound in January. Average prices in July, August, and September were $3.55, $3.61, and $3.66, respectively. The pattern of prices and landings does indicate an inverse relationship between prices and landings (i.e., months with higher landings were associated with a lower average price). Given that market and general economic conditions have changed in the last three years, it is difficult to determine whether these price levels, in an absolute sense or seasonally, are likely to be experienced when the fishery is re-opened. It is worth noting that, in 2010-2011, the average nominal price of vermilion snapper, a primary substitute species in seafood markets and the primary target species on trips catching red snapper, varied on a seasonal basis. Specifically, vermilion prices declined from $3.10 in July to $3.02 and $2.91 in August and September, respectively, likely in part due to increased harvests in anticipation of the closures.

Landings and price determine revenue and thus seasonal variability in either can cause seasonal variability in revenue. From 2005-2009, revenue peaked in December, was relatively high in June and July, was at its lowest in August, and was also relatively low in September.

According to SAFMC (2010a), red snapper is landed mostly in Georgia/northeast Florida, South Carolina, and central-southeast Florida and is caught mostly with vertical lines. In addition, red snapper was not the primary revenue species on most trips that harvested red snapper between 2003 and 2007. On average, 220 vessels landed at least one pound of red snapper per year during those years. Of these 220 vessels, 102 landed less than 100 lbs of red snapper per year, 84 landed 101-1,000 lbs, and only 34 landed more than 1,000 lbs. Red snapper was the primary source of trip revenue on an average of 163 trips per year, or only 12%

of the trips on which it was landed. These trips accounted for approximately 31% of the total commercial harvest.

Red snapper is also part of the mid-shelf snapper grouper complex that includes scamp, gag, vermilion snapper, red porgy, gray triggerfish, and red grouper, among other species. Based on additional data in Appendix O to Amendment 17A (SAFMC 2010a), average landings of red snapper per trip between 2005 and 2008 varied considerably depending on whether red snapper was the primary target species on the trip. Assuming the primary target species is represented by the species accounting for the highest proportion of trip revenue, average red snapper landings per trip was 284 lbs on trips targeting red snapper but only 69 lbs on trips targeting other species.

According to data from 2007 through 2009, the average number of vessels harvesting at least one pound of red snapper per year increased to 243, and actually peaked at 270 vessels in 2009. Similar to the seasonal landings pattern change, this increase in participation was likely at least partly caused by the impending closure of the fishery in 2010 as well as the early closure of vermilion snapper to commercial harvest in September 2009. This data also indicates that, on trips targeting red snapper, 37% landed 100 lbs or less, 29% landed 75 lbs or less, 21% landed 50 lbs or less, and only 9% landed 25 lbs or less. Conversely, on trips targeting other species, 81% of those trips landed 100 lbs or less, 75% landed 75 lbs or less, 67% landed 50 lbs or less, and 49% landed 25 lbs or less. This data also indicates that red snapper was most commonly caught on trips that targeted vermilion snapper or gag. More specifically, only 10% of the trips that caught 100 lbs or less of red snapper actually targeted red snapper. This percentage decreases to 9%, 8%, and 4% for trips that landed at least 75 lbs, 50 lbs, and 25 lbs of red snapper, respectively. Vermilion snapper and gag were the target species on approximately 50% of the trips in each of these instances. These findings generally demonstrate that red snapper landings of 50 or even 100 lbs or less per trip are typically not associated with targeting red snapper, but rather are associated with targeting of other species.

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).

Harvest of red snapper was prohibited in 2010 and 2011. During 2005-2009, commercial harvest of red snapper averaged approximately 171,000 lbs valued at approximately $612,000 (2008 dollars) per year. Thus, the average price of commercially harvested red snapper was approximately $3.58 in 2008 dollars, or $4.15 in 2011 dollars. 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 944, of which 749 were transferable and 195 were non-transferable. Transferable permits have no harvest limit per trip, except for species subject to trip limits while non-transferable permits are restricted to 225 lbs of harvest per trip. The comparable numbers for 2008-2010 were 788 total permits, of which 643 were transferable permits and 145 non-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 Sector

A description of the recreational component of the snapper grouper fishery is contained in Amendment 17A (SAFMC 2010a) and Regulatory Amendment 10 (SAFMC 2011a) and is incorporated herein by reference. The following is a brief summary and updated information, where available.

SAFMC (2011a) 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 of 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, 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 mode (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 the red snapper (220,000 lbs), followed by the charter mode (75,000 lbs), and headboat mode (51,000 lbs). In 2005-2009, recreational harvest of red snapper averaged approximately 557,000 lbs per year.

Recreational effort derived from the Marine Recreational Fisheries 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 (2011a) 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.

Substantially more recreational trips catch snapper grouper species than target these species. 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% of 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.

Similar to the discussion for the commercial sector, the harvest of red snapper was prohibited in the recreational sector in 2010 and 2011. SAFMC (2011a) 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 need not result in the cancellation of a target trip, the popularity of red snapper as a food fish recreational anglers would prefer to retain, as opposed to being primarily a catch and release sport fish for recreational anglers, 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 red snapper catch trips averaged only about 27,000 annually in 2010-2011. 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.

According to SAFMC (2010a), there are distinct seasonal patterns with respect to recreational red snapper catch and effort, as illustrated in **Table 3-3**. According to this

information, red snapper catch and catch effort are highest in May and June (wave 3), while target effort is highest in July and August (wave 4). Catch is also relatively high in March-April (wave 2) and July-August (wave 4), while catch trips are relatively high in July-August (wave 4) and March-April (wave 2). Catch, catch effort, and target effort are at their lowest levels in January and February.

Table 3-3. South Atlantic average red snapper catch, catch trips, and target trips (all modes), by two-month wave, 2003-2008.

	Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sept-Oct	Nov-Dec
Catch (lbs)	38,262	65,142	115,309	64,838	57,314	62,183
Catch trips (thousands)	9.5	15.7	18.8	17.9	13.1	13.6
Target trips (thousands)	4.0	10.3	10.2	12.0	6.7	7.1

Source: MRFSS database, NOAA Fisheries, NMFS, SERO.

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 (2011a) 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 (2011a) 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 in 2009 dollars, or $82.64 in 2011 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), or $76.98 in 2011 dollars, for the second fish harvested. They also estimated red snapper CS values of $11.08 (2003 dollars), or $13.54 in

2011 dollars, for the second fish released due to size limit and $6.86 (2003 dollars), or $8.38 in 2011 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 3-4**. 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 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.

As noted in the previous paragraph, the values provided in **Table 3-4** reflect only effort derived from the MRFSS. Because the headboat sector in the Southeast is not covered in the MRFSS, the results in **Table 3-4** 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.

Table 3-4. 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).

3.3.3 Social Environment

More detailed descriptions of the social environment for the red snapper fishery appear in the SAFMC (2009a; 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 are identified in SAFMC (2011b) with demographic descriptions for those communities. **Figure 3-4** below provides a portrayal of red snapper regional quotient landings and value of landings for South Atlantic communities during 2009, which was the last year prior to the prohibition on landings. 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. Actual percentages for lbs and value regional quotients are not reported to address confidentiality concerns, yet **Figure 3-4** still provides a glimpse of the proportion of red snapper that is landed by the top fifteen communities.

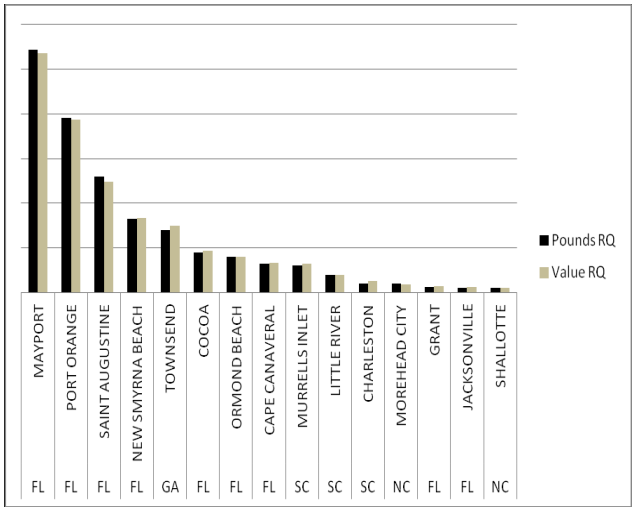


Figure 3-4. Pounds and value RQ for 2009 South Atlantic red snapper

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 influence 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 3-4**, 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. A score above ½ standard deviation is considered engaged or reliant with anything above 1 standard deviation to be very engaged or reliant.

In **Figure 3-5**, 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, FL; Mayport, FL; Townsend, GA; Morehead City, NC; Shallotte, NC; Charleston, SC; Little River, SC; 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.

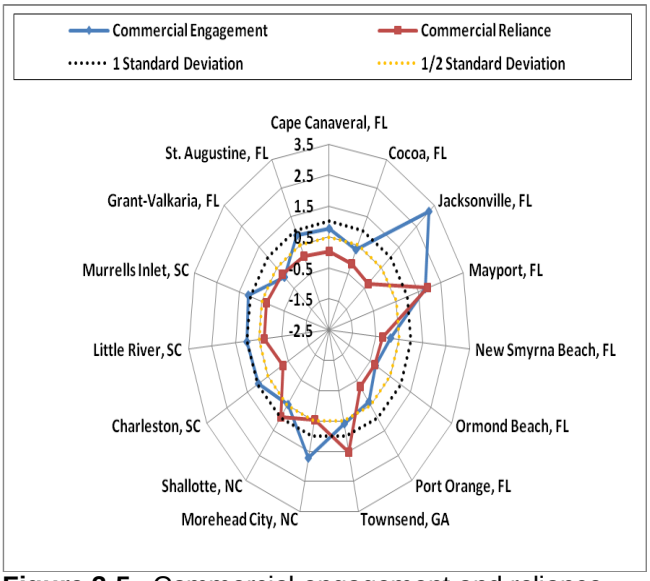


Figure 3-5. Commercial engagement and reliance for South Atlantic red snapper communities.

Although the fifteen communities selected above in **Figure 3-4** 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 they would likely be the same communities where the most commercial landings are. By plotting the recreational engagement and reliance factor scores in **Figure 3-6** 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, FL are also reliant.

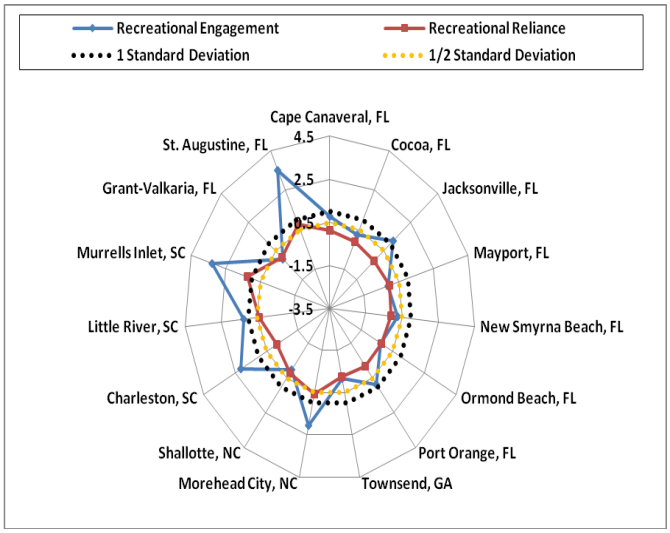


Figure 3-6. Recreational engagement and reliance for South Atlantic red snapper communities.

The communities of Townsend, GA; Morehead City, NC; Murrells Inlet, SC; and Mayport and St. Augustine, FL are all reliant and engaged in either commercial or recreational fishing and therefore would be communities that might be affected by significant changes in regulatory policy, whether positive or negative.

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, it would be considered vulnerable if regulatory action were to cause some type of social disruption.

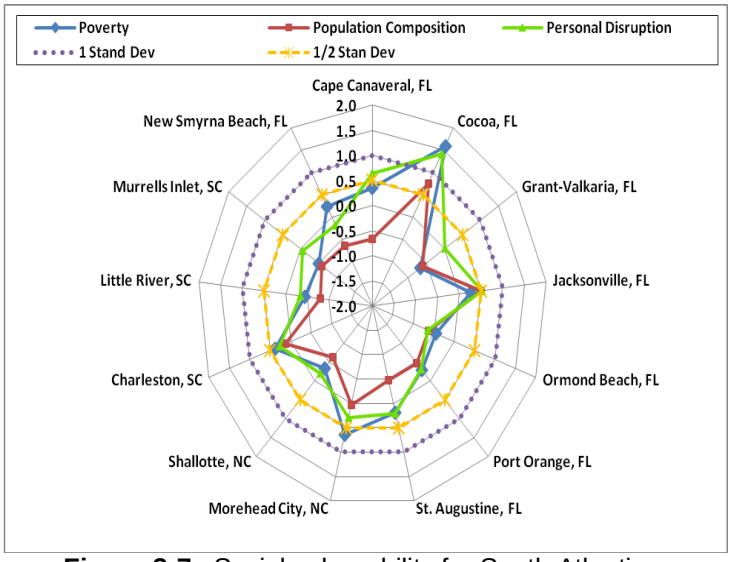


Figure 3-7. Social vulnerability for South Atlantic red snapper communities.

Another type of analysis uses a suite of indices created to examine the social vulnerability of coastal communities and is depicted in **Figure 3-7**. The three indices are poverty, population composition, and personal disruptions. The variables included in each of these indices have been identified through the literature as being important components that contribute to a community's vulnerability. Indicators such as increased poverty rates for different groups; more single female-headed households; more households with children under the age of 5; and disruptions like higher separation rates, higher crime rates, and unemployment all are signs of populations experiencing vulnerabilities. The data used to create these indices are from the 2005-2009 American Community Survey estimates at the U.S. Census Bureau. The thresholds of 1 and ½ standard deviation are the same for these standardized indices. Again, for those communities that exceed the threshold for all indices it would be expected that they would exhibit vulnerabilities to sudden changes or social disruption that might accrue from regulatory change. The only community that exceeds the threshold for all three indices is Cocoa, FL. Morehead City, NC and Cape Canaveral, FL have one index over the threshold, while Jacksonville, FL and Charleston, SC have all three indices very close to the first threshold of ½ standard deviation. The community of Townsend, GA is not included in the graph because there are no census data for the community under the present American Community Survey.

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 that minorities and poverty have in the vulnerability of those being affected by regulatory change. While subsistence fishing is also an activity that can be affected by regulatory change, we have very little, if any, 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, however, crew and some recreational fishermen may use this species as a source of food and subsistence.

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 NMFS.

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 NMFS; 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 Scientific and Statistical Committee (SSC) to review the data and science being used in assessments and fishery management plans/amendments. In addition, the regulatory process is in accordance with the Administrative 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 Atlantic States Marine Fisheries Commission (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.

NMFS' 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-office3.html.

Chapter 4. Environmental Consequences and Comparison of Alternatives

4.1 Action 1. Red Snapper: ACLs, AMs, and Fishing Seasons

4.1.1 Discussion of Sub-alternatives 2a, 2b, and 2c

In order to help the reader understand the equations proposed to calculate the annual catch limits (ACL) for red snapper, Chapter 4 begins with an explanation of the alternatives, while further examples are contained in ***Figure 4-3*** *in the next section.*

Sub-alternative 2a. Annually establish the total ACL (in numbers of fish) based on the formula used to determine the ACL in 2012 as done through the temporary rule through emergency action.

If total removals $_{yr-1} > ABC_{yr-1}$***, then*** $ACL_{yr} = 0$

If total removals $_{yr-1} < ABC_{yr-1}$***, then*** $ACL_{yr} = ABC_{yr} - (estCSR_{yr-2} + estCSR_{yr-1} + ABC_{yr})/3$

Sub-alternative 2b. Annually establish the total ACL (in numbers of fish) based on the following formulas:

If total removals $_{yr-1} > ABC_{yr-1}$***, then*** $ACL_{yr} = 0$

If total removals $_{yr-1} < ABC_{yr-1}$***, then*** $ACL_{yr} = ((ABC_{yr-1} - estCSR_{yr-1})/ABC_{yr-1}) \times ABC_{yr}$

Sub-alternative 2c (Preferred). Annually establish the total ACL (in numbers of fish) based on the following formulas:

If total removals $_{yr-1} > ABC_{yr-1}$***, then*** $ACL_{yr} = 0$

If total removals $_{yr-1} < ABC_{yr-1}$***, then*** $ACL_{yr} = \left(\frac{ABC_{yr-2} - estCSR_{yr-2}}{ABC_{yr-2}} + \frac{ABC_{yr-1} - estCSR_{yr-1}}{ABC_{yr-1}}\right)/2 \times ABC_{yr}$

For the sub-alternatives, ACL_{yr} equals the ACL in the current fishing year, ABC_{yr} equals the acceptable biological catch (ABC) approved by the SSC/Council for the current fishing year, and $estCSR_{yr-1}$ equals the estimated dead discards plus landings during the previous fishing year. ACL_{y-r2} and ABC_{yr-2} equals the ACL and ABC for the two prior fishing years, and $estCSR_{yr-2}$ equals the estimated dead discards plus landings in the two prior fishing years. ACL_{y-r1} and ABC_{yr-1} equals the ACL and ABC for the prior fishing year.

Alternatives 2a-2c (Preferred) propose formulas for the National Marine Fisheries Service (NMFS) and the South Atlantic Fishery Management Council (South Atlantic Council) to use in setting red snapper ACLs (in numbers) on an annual basis. **Sub-alternative 2a** is consistent with the methodology used to set the ACL for the 2012 red snapper opening. This alternative uses commercial and recreational estimated removals calculated by the Southeast Fisheries Science Center (SEFSC) from the two previous fishing years and the ABC from the current fishing year in which the ACL is to be set. The ABC is based on the preferred rebuilding plan projections from the red snapper stock assessment. Estimated removals and the current year ABC are averaged and subtracted from the annual ABC to determine the ACL. If average removals exceed the ABC, then the ACL would be set equal to zero. If average removals are less than the ABC, then an ACL would be set. Using estimated removals from 2010 and 2011 and the 2012 ABC, the ACL was estimated to equal 13,067 fish in 2012 **(Table 4-1)**. **Sub-alternative 2a** is the most simplistic and generally the least conservative of the three sub-alternatives, especially when estimated removals are near the ABC in prior years. However, **Sub-alternative 2a** can result in a lower ACL than **Sub-alternative 2b** when estimated closed season removals are significantly lower than the ABC in the prior fishing year **(Table 4-2)**. Similarly, **Sub-alternative 2a** can result in a lower ACL than **Sub-alternative 2c (Preferred)** when estimated closed season removals two years prior are well below the ABC and estimated closed season removals one year prior are moderately less than the ABC **(Table 4-3)**.

Sub-alternative 2b uses the prior year's closed season removals and ABC to calculate the proportion of the ABC that was caught. This ratio is then applied to the ABC in the following year to calculate the ACL. By using a ratio, this formula takes into account increases in stock abundance projected to occur as the stock rebuilds. The ratio assumes removals in future years would increase at the same rate stock abundance increases. Generally, ACLs estimated by **Sub-alternative 2b** are greater than those estimated by **Sub-alternative 2c (Preferred)** but less than those estimated by **Sub-alternative 2a**. However, **Sub-alternative 2b** can generate ACLs greater than **Sub-alternative 2a** when estimated closed season removals are significantly lower than the ABC in the prior fishing year **(Table 4-2)**. Similarly, ACLs can be less than **Sub-alternative 2c (Preferred)** when estimated closed season removals two years prior are well below the ABC and estimated closed season removals one year prior are near the ABC **(Table 4-3)**. If this formula had been used to set the 2012 ACL, then the ACL would have been 3,487 fish (**Table 4-1**).

Sub-alternative 2c (Preferred) is similar to **Sub-alternative 2b**, but relies on two years of data rather than one. Similar to **Sub-alternative 2b**, this sub-alternative uses the proportion of the ABC caught in the prior two years and then applies the ratio to the ABC in the following year to calculate the ACL. **Sub-alternative 2c (Preferred)** takes into account increases in stock abundance and catches that are projected to occur as the stock rebuilds and is generally the most conservative of the three sub-alternatives. However, **Sub-alternative 2c** can generate ACLs greater than **Sub-alternative 2a** when the proportion of ABC caught in the two prior years is well below the previous ABCs **(Table 4-3)**. Similarly, ACLs can be greater than **Sub-alternative 2b** when estimated closed season removals two years prior are well below the ABC and estimated closed season removals one year prior are near the ABC **(Table 4-3)**. If this formula had been used to set the 2012 ACL, then the ACL would have been zero **(Table 4-1)**.

Table 4-1. Estimated annual catch limits for 2012 fishing year based on formulas summarized in Acton 1, **Sub-alternatives 2a, 2b, and 2c (Preferred)**. ABC_{yr} = acceptable biological catch and $estCSR_{yr}$ = estimated closed season removals (numbers of fish).

	Alternatives		
Estimates	**Alt 2a**	**Alt 2b**	**Alt 2c**
ABC_{2010}			65,000
ABC_{2011}		64,000	64,000
ABC_{2012}	86,000	86,000	86,000
$estCSR_{2010}$	71,394		71,394
$estCSR_{2011}$	61,405	61,405	61,405
avg ($estCSR_{2010-11}$ + ABC_{2012})	72,933		
$propABC_{2010}$			-9.8%
$propABC_{2011}$		4.1%	4.1%
avg $propABC_{2010-11}$			-2.9%
Estimated ACL	**13,067**	**3,487**	**0**

Note: The ACL of 13,067 fish was implemented via emergency rule in 2012.

Table 4-2. Hypothetical example showing how the ACL calculated by **Sub-alternative 2b** could exceed ACLs calculated by **Sub-alternatives 2a and 2c (Preferred)**. ABC_{yr} = acceptable biological catch and $estCSR_{yr}$ = estimated closed season removals (numbers of fish).

	Alternatives		
Estimates	**Alt 2a**	**Alt 2b**	**Alt 2c**
ABC_{yr-2}			65,000
ABC_{yr-1}		64,000	64,000
ABC_{yr}	86,000	86,000	86,000
$estCSR_{yr-2}$	63,000		63,000
$estCSR_{yr-1}$	45,000	45,000	45,000
avg ($estCSR_{yr-2, yr-1}$ + ABC_{2012})	64,667		
$propABC_{yr-2}$			3.1%
$propABC_{yr-1}$		29.7%	29.7%
avg $propABC_{yr-2, yr-1}$			16.4%
Estimated ACL	**21,333**	**25,531**	**14,089**

Note: This is a hypothetical example solely to provide some indication of potential future ACLs.

Table 4-3. Hypothetical example showing how the ACL calculated by **Sub-alternative 2c (Preferred)** could exceed ACLs calculated by **Sub-alternatives 2a and 2b.** ABC_{yr} = acceptable biological catch and $estCSR_{yr}$ = estimated closed season removals (numbers of fish).

	Alternatives		
Estimates	**Alt 2a**	**Alt 2b**	**Alt 2c**
ABC_{yr-2}			65,000
ABC_{yr-1}		64,000	64,000
ABC_{yr}	86,000	86,000	86,000
$estCSR_{yr-2}$	30,000		30,000
$estCSR_{yr-1}$	50,000	50,000	50,000
avg ($estCSR_{yr-2, yr-1}$ + ABC_{2012})	55,333		
$propABC_{yr-2}$			53.8%
$propABC_{yr-1}$		21.9%	21.9%
avg $propABC_{yr-2, yr-1}$			37.9%
Estimated ACL	**30,667**	**18,813**	**32,560**

Note: This is a hypothetical example solely to provide some indication of potential future ACLs.

The ACL for 2013 will be calculated using the values shown in the box below as soon as the missing values are provided by the SEFSC:

Values	Preferred Alternative 2c
ABC_{2011}	64,000 fish
ABC_{2012}	86,000 fish
ABC_{2013}	96,000 fish
$estCSR_{2011}$	
$estCSR_{2012}$	

4.1.2 Biological Effects

No action alternative – 2012 season and continued closure beginning in 2013

The following 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 (75 FR 27658);
- Amendment 17A to the Snapper Grouper FMP (SAFMC 2010a);
- Emergency rule to delay effective date of snapper grouper closure specified in Amendment 17A to the Snapper Grouper FMP;
- Regulatory Amendment 10 to the Snapper Grouper FMP (SAFMC 2011a); and
- Emergency rule to establish a limited 2012 fishing season (NMFS 2012a,b)

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).**

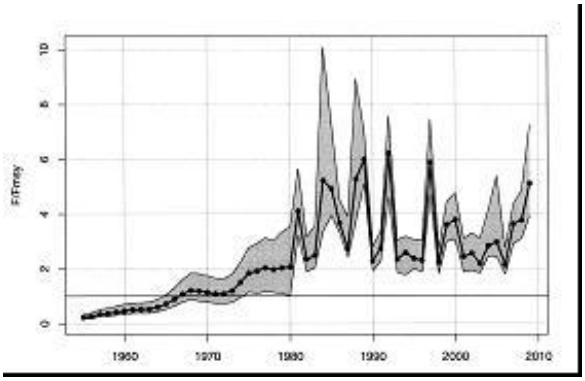


Figure 4-1. The overfishing ratio for red snapper over time. The stock is undergoing overfishing when the F/F_{MSY} is greater than one (SEDAR 24 2010).

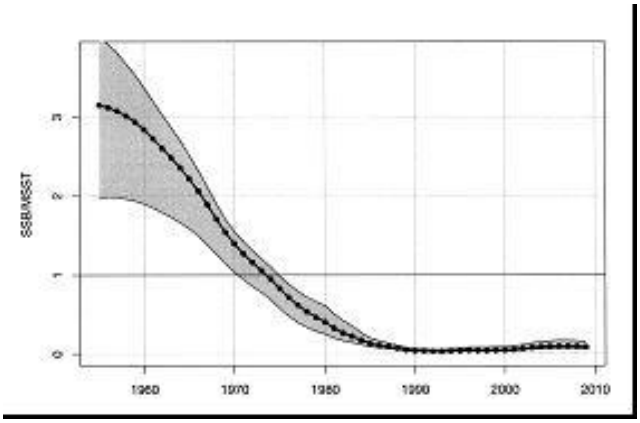


Figure 4-2. The overfished ratio for red snapper over time. The stock is overfished when the SSB/MSST is less than one (SEDAR 24 2010).

In response to the overfishing and overfished stock status of red snapper, fishery managers implemented a harvest and possession prohibition on January 4, 2010. This replaced the 2 fish recreational bag limit and 20" recreational and commercial size limit implemented on January 1, 1992 through Snapper Grouper Amendment 4 (SAFMC 1991). Through Amendment 17A to the Snapper Grouper FMP (SAFMC 2010a), fishery managers continued the harvest prohibition of red snapper through the specification of an ACL equal to zero (landings only) 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 Council and NMFS 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.

Alternative 1 (no action) would have the greatest beneficial effects to the stock (direct effects) and to associated species (indirect effects) as the harvest prohibition would continue.

Alternatives 2 through 4 – Allowing limited harvest in 2013 and beyond

Alternatives 2 through **4** would potentially allow limited harvest and possession of red snapper each year beginning in 2013. **Alternative 2** would establish the formula to determine the ACL. The ACLs determined through the formulas in **Alternative 2** would be 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 would be based (SEDAR 24 and rebuilding projections provided by the SEFSC) has been peer reviewed and the ACLs are based on the best available scientific information.

***Alternatives*[1]**

(preferred alternatives in red)

1. No action. In 2012, ACL=13,067 fish (20,818 lbs comm.[2]/9,399 fish rec). In 2013, ACL = 0 (landings) and prohibition. The 20-inch minimum size limit is not in effect.
2. Computing ACL
   - 2a. Equation 1: 2012 Temporary Rule Method
   - 2b. Equation 2: Previous Year Ratio Method
   - 2c. Equation 3: Two Previous Years Ratio Method
3. Commercial fishing season
   - 3a. Begins 12:01 AM on 2nd Monday in July
   - 3b. Begins 12:01 AM on 1st Monday in August
   - 3c. Begins 12:01 AM on 2nd Monday in September
4. Recreational fishing season (weekends)
   - 4a. Begins 12:01 AM on 2nd Friday in July
   - 4b. Begins 12:01 AM on 1st Friday in August
   - 4c. Begins 12:01 AM on 2nd Friday in September
5. Eliminate 20-inch total length (TL) minimum size limit
6. Commercial trip limit
   - 6a. 25 lbs gutted weight (gw)
   - 6b. 50 lbs gw
   - 6c. 75 lbs gw
   - 6d. 100 lbs gw
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.

Sub-Alternatives 2a, 2b, and **2c (Preferred)** differ in how they would compute the red snapper ACL**. Sub-alternative 2a** would calculate the ACL using the equation used to specify the 2012 ACL in the temporary rule through emergency action (NMFS 2012a). 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 **Appendix A**. **Sub-alternatives 2b** and **2c (Preferred)** would each compare ratios to the present-year ABC to determine the level of removals that would be allowed. The ratio is the level of "left over removals" in previous years to the ABC for those same years.

Differences Between Sub-alternatives 2a, 2b and 2c (Preferred) to Calculate the ACL

To determine the ACL, all three alternatives compare the present year ABC to ABCs and estimated removals. They differ in how the ABCs and estimated removals are calculated as described below.

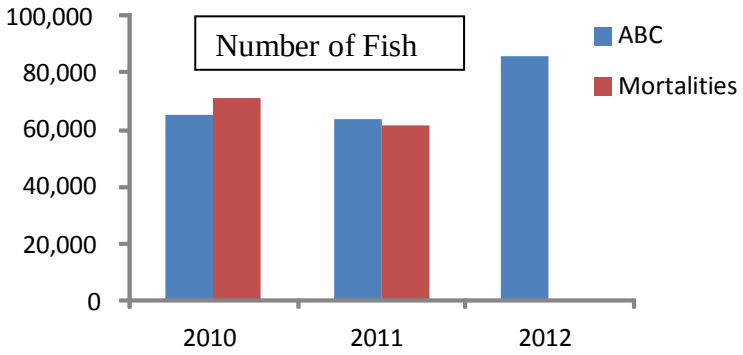
2a. Uses average of 2 prior year's estimated removals + prior years' ABC

2b. Uses ratio of previous year's "left over removals" to previous years ABC

2c (Preferred). Uses ratio of two previous years' "left over removals" to previous years ABC

The ACL values each year from **Sub-alternatives 2a, 2b,** and **2c (Preferred)** are dependent on the ABC and total removals values. An example of the ACLs that would have occurred for 2012 is contained **Figure 4-3** on the following page. In this example, the ACLs decreased from **Sub-alternative 2a (Option 1)** to **2b (Option 2)** to **2c (Option 3)(Preferred)**. Since **Sub-alternative 2a** factors in the most recent ABC and ABCs increase each year in the rebuilding projections, the ACLs in **Sub-alternative 2a** would be the highest value of the sub-alternatives. If this trend in the example were to continue in the future, the positive biological effects to the red snapper stock would increase from **Sub-alternatives 2a** to **2b** to **2c (Preferred)** as the ACLs decrease.

	ABC	Mortalities
2010	65,000	71,394
2011	64,000	61,405
2012	86,000	



Option 1 $ACL_{yr} = ABC_{yr} - (estCSR_{yr-2} + estCSR_{yr-1} + ABC_{yr})/3$

ABC 2012	86,000	
Est. Removals (2010 + 2011 + ABC 2012)	72,933	= (71,394 + 61,405 + 86,000)/3
ACL 2012	13,067	

Option 2 $ACL_{yr} = ((ABC_{yr-1} - estCSR_{yr-1})/ABC_{yr-1}) \times ABC_{yr}$

Est. Removals 2011	61,405	
ABC 2011-Est. Removals 2011	2,595	= 64,000-61,405
Ratio	4.05%	= 2,595/64,000
ACL 2012	3,487	= 4.05% X 86,000

Option 3 $ACL_{yr} = \left(\frac{ABC_{yr-2} - estCSR_{yr-2}}{ABC_{yr-2}} + \frac{ABC_{yr-1} - estCSR_{yr-1}}{ABC_{yr-1}}\right)/2 \times ABC_{yr}$

ABC 2010 - Est. Removals 2010	-6,394	= 65,000-71,394
ABC 2011-Est. Removals 2011	2,595	= 64,000 - 61,405
Ratio 2010	-9.84%	= -6,394/65,000
Ratio 2011	4.05%	= 2,595/64,000
Ratio Average	-2.90%	= (-9.84%+4.05%)/2
ACL 2012	0	= -2.90% X ABC 2012, if negative then ACL = 0

Figure 4-3. An example of the 2012 ACL values using historical estimated removals and ABCs.

For all three sub-alternatives, allowing greater levels of harvest could result in greater biological risks (but perhaps would provide greater short-term social and economic benefits). For instance, if estimated removals are lower than projected, it could be because of lower fishing effort, lower stock abundance, or both. If there are fewer closed season removals than projected because of lower stock abundance, then projected ABCs may be overestimated and allowing higher amounts of harvest may result in higher fishing mortality and impacts to the stock. Similarly, if there are fewer closed season removals due to lower fishing effort, then allowing additional harvest may be consistent with rebuilding the stock. Allowing fewer removals increases the probability of rebuilding as fishing mortality would be lower. The South Atlantic Council's current rebuilding plan allows red snapper removals equivalent to 98% of the yield at F_{MSY}. The overfishing limit for red snapper is set at the yield at F_{MSY}. Given the small buffer between the South Atlantic Council's preferred rebuilding plan and the overfishing limit, any increases in harvest would reduce the probability of successfully rebuilding red snapper. The goal of each of these sub-alternatives is to establish ACLs that maximize allowable yield, while not exceeding the ABC or overfishing limit. **Sub-alternative 2a** poses the greatest biological risk to the stock, followed by **Sub-alternative 2b**, then **Sub-alternative 2c (Preferred)** when removals are at or near ABCs in prior fishing years (see **Table 4-4**).

Table 4-4. Estimated annual catch limits for 2012 fishing year based on formulas summarized in Acton 1, **Sub-alternatives 2a, 2b, and 2c (Preferred).** ABC_{yr} = acceptable biological catch and $estCSR_{yr}$ = estimated closed season removals.

	Alternatives		
Estimates	**Alt 2a**	**Alt 2b**	**Alt 2c**
ABC_{2010}			65,000
ABC_{2011}		64,000	64,000
ABC_{2012}	86,000	86,000	86,000
$estCSR_{2010}$	71,394		71,394
$estCSR_{2011}$	61,405	61,405	61,405
avg ($estCSR_{2010\text{-}11}$ + ABC_{2012})	72,933		
$propABC_{2010}$			-9.8%
$propABC_{2011}$		4.1%	4.1%
avg $propABC_{2010\text{-}11}$			-2.9%
Estimated ACL	**13,067**	**3,487**	**0**

Note: The ACL of 13,067 fish was implemented via emergency rule in 2012.

Alternatives 3 and **4** would establish commercial and recreational seasons respectively. 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 lower adverse effects from potentially lowering ACLs **(Sub-alternative 2a** to **2b** to **Preferred 2c)**; lower ACLs reduce the length of fishing seasons, provide a larger buffer from the ABC, and may reduce the chance that overfishing of the stock would occur.

How many days would be open in 2013?

The length cannot be determined under Sub-alternatives 2a, 2b, and 2c until the estimated removals are available. If the proposed action is implemented, NMFS would compute the number of days. The length of the season would depend on a number of factors, including the ABC and estimated removals.

In 2012, the 86,000 fish ABC and estimated removal levels resulted in a six and 22 day fishing season for the recreational and commercial sectors, respectively. The 2013 ABC is 96,000 fish.

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, establishment of a short 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.

For red snapper, the spawning season extends from May to October, peaking in July through September. As such, the biological effects would be similar between the choice of start dates as outlined in the sub-alternatives under **Alternatives 3** and **4**. Vermilion snapper was closed to commercial harvest in September in 2009 and 2011, and October 2010. Vermilion snapper is the primary target species on trips that commercially harvest red snapper. **Sub-alternatives 3a (Preferred)** and **3b** would allow for harvest of red snapper while vermilion snapper is open. Since vermilion snapper and red snapper co-occur, bycatch of vermilion snapper could be greater under **Sub-alternative 3c** than under **Sub-alternative 3a (Preferred)** and **3b**.

Preferred 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, a portion of which do not survive.

Biological impacts of minimum size limits

Beneficial	Adverse
▶ Decreases mortality rate on younger year class	▶ Encourages harvest of older, larger fish which are generally more productive
▶ 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. If the season were to open, as proposed under **Alternatives 2-4**, and no action was taken to change the size limit, then the minimum size limit of 20 inches TL would still apply **Alternative 5 (Preferred)** would remove the minimum 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. Discard mortality rates of red snapper decrease with shallower water depths of capture.

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 **Alternative 5 (Preferred)** 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% 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, elimination 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

Trip limits proposed in **Alternative 6** would increase the probability that the ACL would not be met during the season and decrease the direct targeting of red snapper while reducing wasteful dead discards. Trip limits range from 25 lbs gw under **Sub-alternative 6a** to 100 lbs gw under **Sub-alternative 6d**. 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. 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. However, improvements to the quota monitoring system have been made, and by July 2013 it is expected that the Generic Dealer Reporting Amendment will be in place requiring dealers to report landings every week through electronic means. Therefore, it is expected that the biological effects of the sub-alternatives could be very similar. If there is a difference in the biological effects, **Sub-Alternative 6d** would be expected to have the least amount of biological benefits, and **Sub-Alternative 6a** would be expected to have the greatest biological benefits. However, more restrictive trip limits also increase the chance an ACL would not be met and optimum yield would not be achieved. Under a trip limit of 50 lbs gw (**Sub-alternative 6b**), commercial harvest of red snapper was reopened twice in 2012 because the ACL was not met. Due to the inability to achieve the commercial ACL during the September 2012 red snapper opening, the South Atlantic Council felt a trip limit of 50 lbs gw was too restrictive. Therefore, they selected **Sub-Alternative 6c (Preferred)**, which would set the commercial trip limit at 75 lbs gw as their preferred alternative.

Preferred 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 recreational fishing season may exceed the recreational ACL. Conversely, the bag limit proposed in **Alternative 7 (Preferred)** could result in beneficial effects by increasing the probability that the ACL would not be exceeded during the 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.

Allowing harvest of red snapper during a short time period, as proposed, offers risk due to estimation and observation uncertainty. 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. If an overage of future ACLs 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. However, any overage is accounted for because the total mortality, including landings associated with an overage, would be captured in the formula to determine the ACL for the following year (**Alternative 2**). Thus, future ACLs would most likely be relatively low and the length of the fishing season would be relatively short. Further, the formula used to specify an ACL captures landings from previous years. If total removals for a previous year exceed the ABC for the following year, the ACL would be 0. Therefore, any overage of an ACL in a previous year is taken into consideration when specifying a future ACL. Fishery managers may minimize the probability of an ACL overage through relatively short openings of the commercial and recreational sectors coupled with effort controls (e.g., recreational bag and commercial 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 implementation of a recreational tag program where retention is limited to those that possess tags as a means of limiting recreational harvest to the recreational ACL.

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 openings 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.

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 South Atlantic 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 in-season 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 recreational opening and to estimate if overages of the ACL have occurred.

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

NMFS completed a biological opinion (opinion) on the South Atlantic snapper-grouper fishery entitled: "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," on June 7, 2006. The opinion concluded the continued authorization of the fishery will not affect marine mammals and is not likely to jeopardize the continued existence of ESA-listed species.

There is likely to be no additional biological benefit to protected species from **Alternative 1 (No Action)** because it would perpetuate the existing level of risk for interactions between Endangered Species Act (ESA)-listed species and the fishery. Previous ESA consultations determined the snapper grouper fishery was not likely to adversely affect marine mammals, Atlantic sturgeon, or Acropora species (See **Appendix G** for discussion of most recent ESA Section 7 consultations).

The impacts from **Alternatives 2-7** on protected resources (e.g., sea turtles and smalltooth sawfish) are not likely to modify the agency action in a manner that will cause new effects not previously considered. Fishing activities anticipated to occur if the proposed action is effective will fall within the level of effort and scope of the action analyzed in the June 7, 2006 opinion. During the harvest prohibition of red snapper, it is possible that fishing effort has been redistributed to target other species. Regardless, elimination of the harvest prohibition to allow for a small increase in the red snapper ACL under this EA is not likely to attract any new effort into the snapper-grouper fishery. Additionally, the proposed action will not change the gears used that were previously evaluated in the opinion, and an ESA Section 7 consultation will be completed to determine whether these determinations are correct and ensure the proposed action is not likely to adversely affect any listed species or designated critical habitat.

4.1.3 Economic Effects

4.1.3.1 Analytical Approach

The procedure for calculating the direct economic effects of the management alternatives for the commercial sector typically involves estimating the expected changes in gross revenue, although net operating revenue and profits maybe better metrics. However, the assignment of costs to harvesting red snapper cannot be undertaken with the currently available data and modeling approaches. Furthermore, because **Alternative 2** only specifies a methodological approach to estimating potential ACLs and the resulting season lengths, quantitative estimates of ACLs and season lengths under those alternatives are not currently available for analytical purposes. In turn, estimates of potential changes in landings in the commercial sector under the various alternatives are not available, which precludes estimation of potential changes in gross revenue as well. Moreover, as previously noted, even if they were available, recent ex-vessel price data for red snapper are not available given the prohibition on commercial harvest in 2010 and 2011. For current purposes, the best available estimate of average annual ex-vessel price if commercial harvest of red snapper is allowed in 2013 is $4.15 (2011 dollars) based on 2005-2009 data.

Similarly, the procedure for calculating the direct economic effects for the recreational sector typically involves estimating the expected changes in consumer surplus (CS) to anglers and net operating revenue (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. NOR is total revenue less operating costs, such as fuel, ice, bait, and other supplies. Again, because quantitative estimates of the potential ACLs and resulting season lengths under **Alternative 2** are not currently available, reliable quantitative estimates of the expected changes in CS and NOR under those alternatives cannot be generated at this time. If recreational harvest is allowed in 2013, the best available estimates of the various CS values are $76.98 (2011 dollars) for the second fish harvested, $13.54 (2011 dollars) for the second fish released due to the size limit, and $8.38 (2011 dollars) for the second fish released due to the bag limit (Carter and Liese 2012). Thus, the CS value of a retained fish is generally much higher than the CS value of a fish released, whether due to the size or, in particular, the bag limit.

As a result of the above information, the expected relative changes in gross revenue for the commercial sector and CS/NOR for the recreational sector are evaluated relative to the no action alternative **(Alternative 1)** on a qualitative basis in general**.** Because the no action alternative prohibits the retention and sale of red snapper, the economic effects of the other alternatives considered in this amendment are generally expected to be positive. Further, the chosen methodological approach for setting the ACL, the resulting season lengths, the fishing season start dates, and other measures are expected to be in place for at least the 2013 and 2014 fishing years but may be adjusted later as new information (e.g., updated stock assessment) becomes available. Thus, the alternatives considered in this amendment are expected to primarily have relatively short-term economic effects.

4.1.3.2 Economic Effects of Alternative 1

Under **Alternative 1 (No Action)**, commercial harvest of red snapper would be prohibited and thus landings and gross revenue would be zero in 2013 and for as long as the ACL was set at zero. In the recreational sector, fish would still be caught by private recreational anglers and for-hire vessels even with the prohibition in place, as illustrated by the fact that 53,101 and 40,237 fish were caught in 2010 and 2011, respectively. Available data suggest recreational anglers and for-hire operators were adjusting to the prohibition on retention in 2010 as catch, catch effort, and target effort declined from 2009 to 2010 and declined further in 2011. Thus, assuming 2011 is more reflective of what is likely to occur in 2013 and beyond if recreational anglers are not allowed to retain red snapper, then the total expected CS in the recreational sector is expected to be $337,186. Since targeting of red snapper in the recreational sector was practically non-existent in 2011, NOR in the for-hire sector from trips targeting red snapper was likely zero as well.

***Alternatives*[1]**

(preferred alternatives in red)

1. No action. In 2012, ACL=13,067 fish (20,818 lbs comm.[2]/9,399 fish rec). In 2013, ACL = 0 (landings) and prohibition. The 20-inch minimum size limit is not in effect.
2. Computing ACL
   - 2a. Equation 1: 2012 Temporary Rule Method
   - 2b. Equation 2: Previous Year Ratio Method
   - 2c. Equation 3: Two Previous Years Ratio Method
3. Commercial fishing season
   - 3a. Begins 12:01 AM on 2nd Monday in July
   - 3b. Begins 12:01 AM on 1st Monday in August
   - 3c. Begins 12:01 AM on 2nd Monday in September
4. Recreational fishing season (weekends)
   - 4a. Begins 12:01 AM on 2nd Friday in July
   - 4b. Begins 12:01 AM on 1st Friday in August
   - 4c. Begins 12:01 AM on 2nd Friday in September
5. Eliminate 20-inch total length (TL) minimum size limit
6. Commercial trip limit
   - 6a. 25 lb gutted weight (gw)
   - 6b. 50 lb gw
   - 6c. 75 lb gw
   - 6d. 100 lb gw
7. Recreational bag limit of 1 fish per person per day

[1]See Chapter 2 for a more detailed description of the alternatives.
[2]Pounds are in gutted weight.

4.1.3.3 Economic Effects of Alternative 2

Alternative 2 would establish the formula to determine the ACL. This ACL would be allocated between the commercial (28.07%) and recreational sectors (71.93%). **Sub-Alternatives 2a, 2b,** and **2c (Preferred)** differ in how they would compute the red snapper ACL**. Sub-alternative 2a** would calculate the ACL using the equation used to calculate the 2012 ACL in the temporary rule through emergency action (NMFS 2012a). **Sub-alternatives 2b** and **2c (Preferred)** would each compare ratios to the present-year ABC to determine the level of removals that would be allowed. The ratio is the level of "left over removals" in previous years relative to the ABC for those same years.

The ACL values each year from **Sub-alternatives 2a, 2b,** and **2c (Preferred)** are dependent on the ABC and total removals estimates. An example of the ACLs that would have occurred for 2012 under these sub-alternatives is contained in **Table 4-1**. In this example, the ACLs decreased

from **Sub-alternative 2a** to **2b** to **2c (Preferred)**. Since **Sub-alternative 2a** factors in the most recent ABC and ABCs increase each year in the rebuilding projections, the ABCs in **Sub-alternative 2a** would generate a higher ACL relative to **Sub-alternatives 2b** and **2c (Preferred)**. Further, **Sub-alternative 2b** generates a higher ACL relative to **Sub-alternative 2c (Preferred)**. If this example is illustrative of the expected relative size of the ACLs under each sub-alternative, the positive economic effects to the commercial sector (higher gross revenue) and recreational sector (higher CS and NOR) relative to **Alternative 1 (No Action)** would be greatest in the short-term under **Sub-alternative 2a**, less under **Sub-alternative 2b**, and the least under **Sub-alternative 2c (Preferred)**. Assuming red snapper would continue to rebuild at basically the same rate under each sub-alternative, the same would also be true with respect to long-term economic benefits.

However, this conclusion must be cautioned because, based on the quantitative estimates in the example, **Sub-alternative 2c (Preferred)** generates an ACL of zero and thus the retention of red snapper would still be prohibited, in which case the commercial and recreational sectors would not experience any economic benefits relative to **Alternative 1 (No Action)**, at least in the short-term. As the resource presumably continues to rebuild, the ABCs would be expected to increase and thus, at some point in the future, a sufficiently positive ACL would be achieved to allow the red snapper portion of the snapper-grouper fishery to re-open.

Similarly, under the current example, although a positive ACL is estimated under **Sub-alternative 2b**, that ACL is approximately 27% of the 2012 ACL implemented under the emergency action. Given that the 2012 commercial fishing season was initially set at only 7 days, and **Alternative 3** specifies that commercial harvest would only be allowed if the projected season is at least 4 days, it is still possible that the commercial sector would be closed under **Sub-alternative 2b** at least in the short-term, though this outcome is also dependent on the trip limit being used in the determination of the season length. The same logic applies to the recreational sector. That is, given the relatively small ACL under **Sub-alternative 2b**, a season length of only two or three 3-day weekends under **Sub-alternative 2a**, and the fact that no recreational season would be allowed if the projected season length was 3 days or less, it is still possible that the recreational sector would be closed under **Sub-alternative 2b** at least in the short-term. Thus, at least in the short-term, it is possible that **Sub-alternative 2b** would not generate economic benefits relative to **Alternative 1 (No Action)**, and would not generate such benefits in the long-term until the ACL is sufficiently high to allow a commercial and/or recreational season of more than 3 days.

In addition, as noted in **Section 4.1.1**, it is possible for **Sub-alternative 2b** to generate ACLs greater than **Sub-alternative 2a** when estimated closed season removals are significantly lower than the ABC in the prior fishing year **(Table 4-2).** Similarly, it is also possible for **Sub-alternative 2c (Preferred)** to generate ACLs greater than **Sub-alternative 2a** when the proportion of ABC caught in the two prior years is well below the previous ABCs **(Table 4-3)**. However, the scenarios illustrated in these examples appear to be less likely than the scenario portrayed in **Table 4-1**. As discussed in **Section 4.1.1**, when estimated removals are near the ABC in prior years, which has been the case in recent years, **Sub-alternative 2a** is not only the most simplistic but also generally the least biologically conservative of the three sub-alternatives. Further, in general, **Sub-alternative 2b** is biologically more conservative than **Sub-alternative 2a** and **Sub-alternative 2c (Preferred)** is the most conservative of the three sub-alternatives with respect to the expected ACLs under each.

In the analysis above, 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 gross revenue or

CS. Exceeding its allocation would bring more economic 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, which would in turn necessitate longer, potential closures. In this event, economic benefits derivable from the harvest of red snapper could be delayed.

It is not possible to determine with certainty if re-opening the harvest of red snapper would entice additional effort from the for-hire sector. However, it is unlikely the for-hire sector would undertake additional trips targeting red snapper, at least in the short-run, and thus net operating revenues (NOR) would not differ between **Sub-alternatives 2a**, **2b**, and **2c (Preferred)** or between these sub-alternatives and **Alternative 1 (No Action)**. 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 alternatives considered in this amendment (e.g., the one-fish bag limit under **Alternative 7 (Preferred)**). Moreover, the relatively small expected ACLs and associated short recreational seasons under each of the sub-alternatives would significantly reduce incentives even further, particularly when combined with a one-fish bag limit. Nonetheless, benefits to anglers would increase on trips for-hire vessels currently take, as they would be allowed to keep their red snapper bag limit. In the event that for-hire trips actually increased in the long-term as ABCs and thus ACLs increased, for-hire vessels' NOR would be expected to increase, and the economic benefits to the recreational sector would therefore be increased. Consistent with previous statements that ACLs would be greater under **Sub-alternative 2a**, the likelihood that for-hire trips targeting red snapper would increase, and thus NOR from for-hire trips, would be greatest under **Sub-alternative 2a**, followed by **Sub-alternative 2b**, and least likely under **Sub-alternative 2c (Preferred)**. However, the likelihood of the recreational sector exceeding its allocation would also be higher in the long-term under **Sub-alternative 2a**, 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 **Alternatives 5 (Preferred)** and **7 (Preferred)**.

Similarly, an additional issue is whether the re-opening of red snapper to commercial harvest, as would be the case under **Sub-alternative 2a** according to the example in **Table 4-1**, would lead to effort increases in the red snapper segment in particular and the snapper grouper fishery in general. An increase in commercial sector effort appears to be unlikely. In 2010-2011, when red snapper harvest was prohibited, the commercial sector discarded an average of about 118,000 lbs of red snapper, which is significantly greater than the ACL under **Sub-alternative 2a** in the example provided in **Table 4-1**. If commercial harvest was allowed, some of these discards would be kept and generate additional revenue to the vessels. There is always the possibility that some vessels may increase their target effort for red snapper, but the combination of any of the trip limits considered under **Alternative 6** in addition to the relatively low ACL and the currently low level of abundance suggests the likelihood that commercial red snapper target effort would increase is very low, at least in the short-term. Thus, in the short-term, red snapper is likely to be incidentally harvested on trips targeting other species as opposed to on trips targeting red snapper under any of the sub-alternatives.

Whether effort in the recreational sector would increase is not quite as clear as in the commercial sector. Recreational effort could remain the same if anglers take trips as usual but 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 on the same trip, affecting the level of economic benefits derivable from all such species.

To conclude, given the foregoing discussions, **Sub-alternative 2a** is expected to generate the largest increase in gross revenue to the commercial sector and increase in CS to the recreational sector, followed by **Sub-alternative 2b**, and **Sub-alternative 2c (Preferred)**, relative to **Alternative 1 (No Action)**. Increases in NOR for the for-hire segment of the recreational sector are unlikely under any of the sub-alternatives in the short-term, but may occur in the long-term once ABCs and the resulting recreational ACL and season length are sufficiently large to induce increased targeting of red snapper in the for-hire sector. Although such increases in NOR in the long-term are most likely under **Sub-alternative 2a**, followed by **Sub-alternative 2b**, and **Sub-alternative 2c (Preferred)**, it is quite possible that these outcomes will change in the long-term as a result of new information (e.g., updated stock assessment).

4.1.3.4 Economic Effects of Alternative 3

Alternative 3 would establish the starting date of the commercial season. Specifically, the commercial season would start on the second Monday in July, the first Monday in August, or the second Monday in September under **Sub-alternative 3a (Preferred), 3b,** and **3c**, respectively. Thus, assuming commercial harvest is allowed, the primary question is whether any differences in economic benefits are expected depending on whether the season starts on any of these three alternative dates. The available data do not provide a basis for a definitive conclusion in this respect and the answer partly depends on the status of related species (e.g., vermilion snapper).

As previously noted, given the relatively small ACLs expected under any of the sub-alternatives for **Alternative 2** and the relatively small trip limits under the sub-alternatives for **Alternative 6**, it is expected that red snapper would be harvested incidentally on trips targeting other species, such as vermilion snapper and gag, rather than targeted. The lack of targeting and small ACL suggests that derby fishing conditions are unlikely to occur, which would help avoid any price reductions due to market gluts. Available data from 2005-2009 when commercial harvest was allowed indicates that red snapper price tended to be relatively high but red snapper landings and revenue tend to be relatively low in September, though revenue is at its lowest in August. In addition, vermilion snapper was closed to commercial harvest in September in 2009 and 2011, with prices steadily declining from July through September in anticipation of those closures. Vermilion snapper and gag are the primary target species on trips that commercially harvest red snapper. If vermilion snapper or gag is closed, then it is highly likely they will not be targeted on trips taken by commercial vessels, which would in turn prevent the harvest of red snapper on such trips. Economic benefits from the ability to retain red snapper would likely be higher when vermilion snapper and gag can be commercially harvested than when they cannot.

Given this information, relative to **Alternative 1 (No Action)**, the economic benefits from allowing commercial harvest of red snapper may be highest if the red snapper season is opened in July, as would be the case under **Sub-alternative 3a (Preferred)**, than if it were opened in August (**Sub-alternative 3b**) or September (**Sub-alternative 3c**). Conversely, economic benefits may be the lowest if the season is opened in September (**Sub-alternative 3c**) relative to **Alternative 1 (No Action)**.

4.1.3.5 Economic Effects of Alternative 4

Alternative 4 would establish the start date of the recreational season. Specifically, the recreational season would start on the second Friday in July, the first Friday in August, or the second Friday in September under **Sub-alternative 4a (Preferred), 4b,** and **4c**, respectively. Thus, assuming recreational harvest is allowed, the primary question is whether any differences in economic benefits are expected depending on whether the season starts on any of these three alternative dates. Information that would assist in rendering such a determination is fairly limited. For example, no information exists as to whether CS values vary on a seasonal basis.

However, information on recreational red snapper catch, catch effort, and target effort (see **Table 3-3**) indicate that economic benefits may differ between some of the sub-alternatives. Specifically, catch, catch effort, and target effort are higher in July and August (wave 4) than in September (wave 5). In fact, target effort is highest in wave 4 relative to other waves during the year. Assuming catch and catch effort are reflective of when red snapper are relatively more available to the recreational sector, and that target effort reflects when red snapper are relatively most valued, then opening the season in July or August (**Sub-alternatives 4a (Preferred)** and **4b**) would generate greater economic benefits to the recreational sector than in September (**Sub-alternative 4c**), relative to **Alternative 1 (No Action)**. Since catch, catch effort, and target effort are estimated by wave, it is not possible to determine whether economic benefits differ between **Sub-alternatives 4a (Preferred)** and **4b** based on this information. Given that catch and catch effort are at their peak in May-June (wave 3), it is possible that economic benefits to the recreational sector would be even greater if the Council considered potential start dates to the recreational season in those months.

4.1.3.6 Economic Effects of Alternative 5

Alternative 5 (Preferred) would eliminate the commercial and recreational size limit for red snapper during the respective commercial and recreational fishing seasons. This alternative has contrasting possibilities with respect to affecting the fishing costs for commercial vessels, which are at least partly dependent on the selection of other alternatives. In general, costs could decrease on trips targeting red snapper 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 if a limit is implemented (**Alternative 6**), and thus would be motivated to undertake many shorter trips. If this action promotes derby-style behavior, fishing costs for the industry could increase as more vessels undertake many shorter trips before the season closes. This possibility could lead to the commercial sector exceeding its ACL. On the other hand, an increase in the number of short trips would be expected to lower the likelihood of discards.

However, these effects generally presume that red snapper would be commercially targeted which is unlikely, at least in the short-run, given the relatively small ACLs expected under **Alternative 2**, the relatively small trip limits considered under **Alternative 6**, and the relatively low level of abundance at present. Assuming red snapper are caught incidentally on trips targeting other species (e.g., vermilion snapper and gag), eliminating the size limit may marginally reduce costs by reducing the time spent culling fish to separate the legal-sized fish. It is also still possible that eliminating the size limit could reduce trip length and trip costs. If fishermen target a certain amount of fish and associated level of

revenue on each trip, by eliminating discards due to the size limit, they would reach that level of production and revenue sooner, thereby allowing them to reduce trip length and thus trip costs.

Thus, the economic effects of **Alternative 5 (Preferred)** are expected to be positive (i.e., reduction in trip costs) though relatively small for the commercial sector in the short-term. In the long-term, the reductions in trip costs would be expected to increase, at least for a time, as the stock recovers and ACLs are increased, though the magnitude of these effects will be dependent on whether a commercial trip limit is selected under **Alternative 6**. In general, the larger the trip limit, the greater the economic benefits from elimination of the size limit.

Alternative 5 (Preferred) would allow recreational anglers to keep whatever size fish they catch. Because CS is higher for kept fish than for discarded fish, anglers who catch and keep red snapper could experience a 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 one-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 **Alternative 7 (Preferred)**.

4.1.3.7 Economic Effects of Alternative 6

Alternative 6 would establish a commercial trip limit. The trip limit would be 25 lbs gutted weight (gw) (**Sub-alternative 6a**), 50 lbs gw (**Sub-alternative 6b**), 75 lbs gw (**Preferred Sub-alternative 6c**), or 100 lbs gw (**Sub-alternative 6d**). It is critical to remember that the imposition of a trip limit will have no effect on gross revenue to the commercial sector. Gross revenue to the commercial sector is dependent on the commercial sector's ACL/quota, which would be determined by the sub-alternative selected under **Alternative 2**. As discussed earlier in the document, the greater the commercial ACL/quota, the greater would be the gross revenue in the commercial sector. The largest gain in gross revenue relative to **Alternative 1 (No Action)** is expected to accrue under **Sub-alternative 2a**. It is also important to remember that, under **Alternative 1 (No Action)**, commercial harvest of red snapper would be prohibited, which would preclude incidental harvest of red snapper on commercial trips in addition to targeting of red snapper on those trips.

The function of a trip limit is to spread out the available commercial harvest across as many trips as possible in order to broaden the distribution of economic benefits across participants, in part for equity reasons, but also typically to avoid the race for fish, market gluts, and associated reductions in ex-vessel prices. However, in the current case, the commercial ACL/quota is expected to be relatively small, at least in the short-term, and thus increased commercial targeting of red snapper, the race for fish, market gluts, and reduced prices are not expected. The ACL/quota would have to be considerably higher, and the trip limits under consideration and abundance would have to be at least somewhat higher, before any of these effects are likely to occur. As previously explained, the combination of these factors at present would likely cause red snapper to be almost if not entirely harvested incidentally on trips targeting other species (e.g., vermilion snapper, gag, etc.). In addition, unlike in the recreational sector, there is no economic benefit to extending the commercial season as long as possible, at least not in the short-term under current circumstances.

Given the above, the primary economic question is the likely effect alternative trip limits would have on trip costs. From an industry and vessel level perspective, given that gross revenue from red snapper harvest is capped by the commercial ACL/quota, the goal is to produce that level of landings and revenue at the lowest possible cost, assuming harvesters are maximizing or at least attempting to maximize profit. In general, the lower the level of effort required to generate those landings and revenue, the lower would be the costs and the greater would be net revenue. Thus, assuming a trip is a reasonable measure of effort, it would be economically desirable to harvest the available quota with the lowest possible number of trips.

In general, **Sub-alternative 6a** would require four times as many trips be taken to harvest the available quota and associated gross revenue relative to **Sub-alternative 6d** and twice as many as under **Sub-alternative 6b**. In turn, the costs of harvesting the available quota are expected to be approximately four times greater and twice as much under **Sub-alternative 6a** relative to **Sub-alternatives 6d** and **6b**, respectively. Thus, under the current circumstances and current set of sub-alternatives considered under **Alternative 2** and **Alternative 6**, **Sub-alternative 6d** would allow the commercial quota and associated gross revenue to be produced at the lowest possible cost, followed by **Sub-alternative 6c (Preferred)**, **Sub-alternative 6b**, and **Sub-alternative 6a**. Thus, net revenue in the commercial sector in the short-term is expected to be greatest under **Sub-alternative 6d** and lowest under **Sub-alternative 6a** relative to **Alternative 1 (No Action)**.

In general, **Alternative 6** would help in ensuring the commercial ACL is not exceeded. Overages could require more stringent regulations (e.g., reductions in future year's ACLs and commercial quotas), in addition to prohibiting harvest of red snapper in the short-term, on commercial vessels harvesting snapper grouper. In this respect, the long-term economic effects of this alternative may be considered positive. However, such effects will likely not differ across the four sub-alternatives.

4.1.3.8 Economic Effects of Alternative 7

Alternative 7 (Preferred) would establish a recreational bag limit of 1 fish per person per day. Available information indicates a CS value of $76.98 (2011 dollars) is assigned to one 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, according to available information, a released red snapper is assigned a CS value 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 estimate is a net value that 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.

Alternative 7 (Preferred) in combination with **Alternative 5 (Preferred)** could promote high-grading, given the usual understanding that a larger 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.

The question of whether the re-opening of the red snapper season would increase total recreational effort is an open question, but is unlikely for previously explained reasons. However, if the re-opening of the red snapper season did lead to an increase in target effort for red snapper, it is likely that most of it would come from private mode anglers. In 2009, the private mode accounted for over 90% of all target trips for red snapper, although this excludes headboat data. A one-fish bag limit, however, would constrain the harvest by private mode anglers and thus also the benefits they could derive from catching red snapper.

The economic benefits in terms of additional red snapper CS under **Alternative 7 (Preferred)** cannot be estimated without knowing the recreational ACL. Thus, the economic benefits of **Alternative 7 (Preferred)** are dependent on the choice of sub-alternative under **Alternative 2** and whether targeting of red snapper would increase, as the latter would potentially affect red snapper catch per trip. For example, assuming the example in **Table 4-1** reflects relative differences in ACLs between the sub-alternatives under **Alternative 2**, and assuming a one-fish bag limit in combination with other factors is insufficient to induce targeting, the relative magnitude of those effects can be evaluated. In general, the greater the recreational ACL, the greater would be the economic benefits of **Alternative 7 (Preferred)**.

To illustrate, the maximum number of trips for keeping red snapper would theoretically be equal to the recreational ACL of 9,399 under **Sub-alternative 2a** according to the example in **Table 4-1**. In 2010-2011, the average number of catch trips was approximately 27,000 and the average annual red snapper catch was approximately 46,669 fish, yielding an average catch of 1.73 fish per trip. On the first 9,399 trips catching red snapper after the season is opened, the average CS for red snapper on those trips would be $83.10 ($76.98 for 1 fish kept and $6.12 for the remaining .73 fish). The total red snapper CS on those trips would be $781,057. The other 17,601 trips would not be allowed to retain red snapper. The CS per red snapper caught would be $8.39 on those trips. Again, assuming 1.73 red snapper are caught per trip, total CS for red snapper of $255,473 on those trips. Thus, total CS for red snapper on all trips would be approximately $1.037 million, or a gain of more than $699 thousand in red snapper CS relative to **Alternative 1 (No Action)**.

On the other hand, under **Sub-alternative 2b**, the maximum number of trips for keeping red snapper would theoretically be equal to the recreational ACL of 2,508 according to the example in **Table 4-1**. Using the same methodology as above, the CS value of red snapper on the first 2,508 trips would be $208,415, the CS value on the other 24,492 trips would be $355,494, yielding an estimate of $610,962 in total, or approximately $426,000 less than under **Sub-alternative 2a** but about $274,000 more than under **Sub-alternative 2c (Preferred)** and **Alternative 1 (No Action)**.

According to the example in **Table 4-1,** the recreational ACL would be zero under **Sub-alternative 2c (Preferred)**. Thus, retention of recreationally caught red snapper would still be prohibited, CS under **Alternative 7 (Preferred)** would be equivalent to CS under **Alternative 1 (No Action)**, and no economic benefits would result in the short-term. However, in the long-term, it is expected that the economic benefits of **Alternative 7 (Preferred)** in combination with **Sub-alternative 2c (Preferred)** would be positive and thus greater than under **Alternative 1 (No Action)** as the stock recovers, and the ABC and ACL increase, noting again that the resulting ACL under the formula may change in the long-term due to new information (e.g., updated stock assessment).

This alternative would also assist in keeping the recreational sector from exceeding its ACL, which is important because of the difficulty of monitoring recreational harvest on a real time basis. Thus, the long-term economic effects of this alternative would likely be positive for this reason as well.

4.1.4 Social Effects

The decision to allow for the harvest of red snapper in South Atlantic waters is likely to have positive social effects, as the closure of this portion of the snapper grouper fishery was highly controversial. Public comment suggested that there were more red snapper than what was reflected in the stock assessment science. The temporary opening as a result of lower discards was likely perceived positively and may have had positive economic and social effects. **Alternative 1 (No action)** would keep current regulations, which do not allow any harvest, in place. Such action would likely be perceived negatively by stakeholders in both the commercial and recreational sectors as much of the public comment suggested that there would be negative social and economic impacts from the closure initially. Furthermore, because there was a temporary seasonal opening during the 2012-fishing year, stakeholders might expect similar action in years to follow. Because of the economic downturn, fishing businesses and individuals are experiencing economic stress that could be negatively affected by slight disruptions in revenues or positively affected by increases in that revenue. Establishing a process to allow limited harvest of red snapper, as proposed under this action, would give fishermen the opportunity to comment on the process and the ability to plan ahead, both of which would have positive social impacts.

Alternatives 2 through 4 – Allowing limited harvest beginning in 2013

By allowing an ACL for red snapper in **Alternative 2**, there should be positive social effects as it would remove uncertainty and should increase revenues, if only slightly. It is difficult to determine how fishing behavior would change, because **Sub-alternatives 2a, 2b,** and **2c (Preferred)** offer differing methods to calculate the allowable ACL for red snapper based upon estimated removals and previous year's ABC. It is assumed that with any increase in ACL there would be increased fishing opportunities that would allow for increased commerce for for-hire fishers and associated businesses. Commercial fishermen may be able to keep more red snapper that might be discarded otherwise. Therefore, there should be an overall positive social effect. However, the methods for calculating the ACL differs considerably between the sub-alternatives, with a more conservative method being adopted going from **Sub-alternative 2a** to **2b** with **2c** being the most conservative. The example in **Figure 4-3** provides estimates of ACLs based upon what would have occurred in 2012 and demonstrates that the ACL could end up being zero even if discards are less than projected. Based upon the method of calculation, **Sub-alternative 2a** should have the highest ACL value and therefore would likely have the greatest positive social effects. Because of the limited opportunity from such a small ACL, the development of derby fishing where many vessels are pursuing red snapper at the same time could occur. This can place vessels in direct competition or force some to fish in weather that is dangerous and may depend upon the timing of the opening as discussed below. Because **Sub-alternatives 2b** and **2c (Preferred)** are more conservative in their calculation they would have a more positive effect on stocks that could have a longer term positive social effect as stocks rebuild. Unfortunately, we are unable to calculate any real short-term effects from the lower ACLs that might result. If the economy is recovering, then it might be assumed that the short-term negative effects from lower ACLs could be outweighed by the longer-term positive

effects of conservation. Yet, if fishing businesses are not recovering as well, they may not see the positive effects in the long term.

Establishing a season for the commercial sector as an accountability measure under **Alternative 3** with its **Sub-alternatives 3a (Preferred), 3b,** and **3c** is likely to have few social effects other than to ensure that the ACL is not exceeded, which should be positive. As mentioned above, derby fishing is possible, but for the commercial sector, it may not be as problematic if they do not target red snapper and only retain incidentally caught fish. **Sub-alternatives 3a (Preferred), 3b,** and **3c** offer alternative openings on the second Monday in July, first Monday August, and second Monday in September, respectively. The social impacts from these alternatives may depend upon the location of the stakeholder as to which date is preferred. As for the recreational sector under **Alternative 4** with its **Sub-Alternatives 4a (Preferred), 4b,** and **4c** with similar varying opening dates, there should also be positive social effects, although a derby fishery might be more likely. Again, the alternative that offers the most positive social effects may depend on where a stakeholder may reside with regard to a preferred opening date. Overall, the accountability measure should have positive social effects as some method for curtailing overages is in place and can ensure a more viable stock in the future.

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

The suspension of the minimum size limit under **Alternative 5 (Preferred)** 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.

Alternative 6 – Commercial trip limits

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 (**Sub-alternative 6d**) a more targeted fishery might develop and a derby fishery appear, 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 can 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 and an early closure might occur.

Preferred Alternative 7 – Recreational bag limit

The establishment of a one fish bag limit with **Alternative 7 (Preferred)** would have a similar effect for recreational fishermen as **Alternative 6** and its sub-alternatives does for commercial fishermen by extending the recreational 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. Yet, a one fish bag limit can also contribute to regulatory discards as fishermen keep larger fish and discard smaller ones. How much this might occur in the red snapper recreational sector is unknown at this time.

Alternatives[1]
(preferred alternatives in red)

1. No action. In 2012, ACL=13,067 fish (20,818 lbs comm.[2]/9,399 fish rec). In 2013, ACL = 0 (landings) and prohibition. The 20-inch minimum size limit is not in effect.
2. Computing ACL
   - 2a. Equation 1: 2012 Temporary Rule Method
   - 2b. Equation 2: Previous Year Ratio Method
   - 2c. Equation 3: Two Previous Years Ratio Method
3. Commercial fishing season
   - 3a. Begins 12:01 AM on 2nd Monday in July
   - 3b. Begins 12:01 AM on 1st Monday in August
   - 3c. Begins 12:01 AM on 2nd Monday in September
4. Recreational fishing season (weekends)
   - 4a. Begins 12:01 AM on 2nd Friday in July
   - 4b. Begins 12:01 AM on 1st Friday in August
   - 4c. Begins 12:01 AM on 2nd Friday in September
5. Eliminate 20-inch total length (TL) minimum size limit
6. Commercial trip limit
   - 6a. 25 lb gutted weight (gw)
   - 6b. 50 lb gw
   - 6c. 75 lb gw
   - 6d. 100 lb gw
7. Recreational bag limit of 1 fish per person per day

[1]See Chapter 2 for a more detailed description of the alternatives.
[2]Pounds are in gutted weight.

4.1.5 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 1 (No action) would not allow harvest of red snapper beginning in 2013 and would have the least amount of adverse, administrative effects. There are administrative effects to NMFS, the South Atlantic Council, and the states from monitoring the ACL, implementing rule-making, enforcing regulations, and announcing openings and closings through outreach efforts.

Alternative 2 and associated sub-alternatives would establish a process to set an ACL for red snapper beginning in 2013. 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 would require extensive outreach to explain the mechanics of the ACL and monitoring. All of the alternatives in this action would increase the administrative impacts on the agency.

Alternative 3 and **Alternative 4** would result in the greatest administrative impacts compared to the no action alternative. There was a short fishing season in 2012; however, under the no action alternative, there would not be a red snapper opening in 2013. The proposed fishing 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. As specified in **Alternatives 3** and **4**, the fishing seasons would not open if the projections produce fishing seasons of three days or less. Not specifying a short fishing season would reduce administrative effects to NMFS, the South Atlantic Council, and the states.

In **Alternatives 3** and **4, Sub-alternatives a (Preferred), b, and c** would begin the season in July, August, and September, respectively. A July opening ("a" sub-alternatives) could cause adverse administrative effects to NMFS compared to the other sub-alternatives as the time in between when all data are available from the previous year (March) and the opening (July) is the least amount. In general, the administrative effects to NMFS decreases from **Sub-alternatives a** to **b** to **c**.

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

Alternative 6 and associated sub-alternatives would establish a commercial trip limit of varying weights during the fishing seasons. Establishing a commercial trip limit would result in increased enforcement needs and outreach. Regardless of which sub-alternative is selected, the administrative impacts would be similar.

Alternative 7 (Preferred) would specify a 1 fish recreational bag limit and would increase the administrative impacts by increasing enforcement needs and outreach.

Outreach and Education

The announcement of the ACL and fishery openings would be published in the *Federal Register* as a rule and will be communicated to interested parties via Fishery Bulletin, website updates, Twitter, and NOAA Weather Radio updates. Fishery

***Alternatives*[1]**

(preferred alternatives in red)

1. No action. In 2012, ACL=13,067 fish (20,818 lbs comm.[2]/9,399 fish rec). In 2013, ACL = 0 (landings) and prohibition. The 20-inch minimum size limit is not in effect.
2. Computing ACL
   - 2a. Equation 1: 2012 Temporary Rule Method
   - 2b. Equation 2: Previous Year Ratio Method
   - 2c. Equation 3: Two Previous Years Ratio Method
3. Commercial fishing season
   - 3a. Begins 12:01 AM on 2nd Monday in July
   - 3b. Begins 12:01 AM on 1st Monday in August
   - 3c. Begins 12:01 AM on 2nd Monday in September
4. Recreational fishing season (weekends)
   - 4a. Begins 12:01 AM on 2nd Friday in July
   - 4b. Begins 12:01 AM on 1st Friday in August
   - 4c. Begins 12:01 AM on 2nd Friday in September
5. Eliminate 20-inch total length (TL) minimum size limit
6. Commercial trip limit
   - 6a. 25 lb gutted weight
   - 6a. 50 lb gutted weight
   - 6c. 75 lb gutted weight
   - 6d. 100 lb gutted weight
7. Recreational bag limit of 1 fish per person per day

[1]See Chapter 2 for a more detailed description of the alternatives.
[2]Pounds are in gutted weight.

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 Quota 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. For the 2012 limited season, the states had extra dockside samplers to collect biological data on landed fish and count vessels as they leave ports to try to quantify effort. It is unknown whether those same efforts will be available for future red snapper seasons.

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

During the September 2012 South Atlantic Fishery Management Council (South Atlantic Council) meeting, the Snapper Grouper Committee discussed Amendment 22 to the Snapper Grouper FMP, which proposed to develop recreational tag programs for red snapper and 3 deepwater species (golden tilefish, snowy grouper, and wreckfish). Committee members expressed concern, however, with the use of a tag program for long-term management of red snapper. Some members stated that there would be a greater economic benefit to having particular open seasons where headboat and charter boat operators could put effort into publicizing catching a particular species, such as red snapper, regardless of how short the opening. A tag program to open the recreational harvest of red snapper was perceived as too limited, virtually devoid of economic value, and not truly an open season. Further, Committee members stated that a recreational tag program could result in a situation where a number of tags would be issued to people throughout the United States who might ultimately not use them, whereas, with seasonal openings fishermen and for-hire operators could plan in advance and derive greater benefits. After a lengthy discussion on whether a recreational tag program would be effective to allow recreational harvest of red snapper, the South Atlantic Council decided to focus instead on establishing a process to allow limited harvest (commercial and recreational) in 2013 and beyond.

Therefore, in September 2012, the South Atlantic Council approved including an action in Regulatory Amendment 15 to the Snapper Grouper FMP to address long term management of red snapper. Regulatory Amendment 15 was chosen because the South Atlantic Council felt it could be developed relatively quickly to have regulations implemented in time for the summer of 2013. After the September meeting, however, NOAA General Counsel determined the existing snapper grouper framework did not allow for the establishment of this process, hence any action to establish such a process would need to be addressed through a plan amendment. Subsequently, the action to establish a process to allow limited harvest of red snapper was moved out of Regulatory Amendment 15 and developed in Amendment 28 to the Snapper Grouper FMP.

One public hearing was held at the December 2012 South Atlantic Council meeting and a one-month comment period was announced for the public to submit written comments. Relatively few comments were received, however. The majority of comments supported use of the two previous years' ratio (**Alternative 2, Sub-alternative 2c**) to calculate the red snapper annual catch limit (ACL). Recreational fishermen did not support the establishment of a commercial fishing season and preferred **Sub-alternative 4a** for the recreational season (beginning on the first Friday in August). The majority of the comments supported elimination of the 20-inch minimum size limit and a red snapper recreational bag limit of one fish per person per day. Among the actions suggested in the comments were:

- Consider a commercial trip limit of 100 lbs gutted weight (gw) year round with the exception of spawning periods when the season should be closed for both commercial and recreational sectors.
- Continue to support the Cooperative Research Program data collection process for red snapper.
- Return to a recreational bag limit of 2 per person, a minimum size limit of 20 inches total length, and open red snapper year round.

- Consider a "commercial by-catch ACL". Incidentally, caught red snapper would be reported through dealer trip tickets and would supply useful data.

The Snapper Grouper Advisory Panel (AP) discussed Amendment 28 during their November 2012 meeting. The AP recommended use of **Sub-alternative 2a** to calculate the red snapper ACL, the same method used to calculate the ACL for the 2012 summer opening. The AP recommended the commercial season begin on the second Monday in September **(Sub-alternative 3c)** and the recreational season begin on the second Friday in September **(Sub-alternative 4c)**. The AP also suggested establishment of a 100-lb gw commercial trip limit **(Sub-alternative 6d)**, elimination of the minimum size limit **(Alternative 5)**, and a recreational bag limit of 1 red snapper per person per day **(Alternative 7)**. In addition, the AP recommended that the red snapper recreational season remain open until the ACL is projected to be met.

The Scientific and Statistical Committee (SSC) discussed the proposed actions in Amendment 28 at their October 2012 meeting. The SSC did not offer comments on any alternative or sub-alternative with the exception of **Sub-alternative 2a**. The SSC questioned the inclusion of the current ABC in the average of total removals. Overall, the SSC suggested the South Atlantic Council choose the simplest alternative (easiest to explain to industry) that would allow harvest without negatively affecting the rebuilding plan.

The Law Enforcement Advisory Panel (LEAP) did not review the amendment at a scheduled meeting. Instead, members received a draft of the amendment and were asked to submit comments to staff. No comments from LEAP members were received on Amendment 28.

The South Atlantic Council reviewed Amendment 28, selected preferred alternatives, and approved the amendment for formal review at its December 2012 meeting. During the December meeting, the South Atlantic Council staff presented the methods used to calculate the red snapper ACL in 2012 and the sub-alternatives being proposed in the amendment to the Council members. **Sub-alternatives 2b** and **2c** use the ratio of observed discards to the ABC to calculate a given year's total ACL. **Sub-alternative 2a**, on the other hand, uses the next year's ABC as part of the estimator of management action effectiveness. As previously mentioned, the SSC questioned this component of the proposed equation. The approach

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(preferred alternatives in red)

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2. Computing ACL
   - 2a. Equation 1: 2012 Temporary Rule Method
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4. Recreational fishing season (weekends)
   - 4a. Begins 12:01 AM on 2nd Friday in July
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   - 4c. Begins 12:01 AM on 2nd Friday in September
5. Eliminate 20-inch total length (TL) minimum size limit
6. Commercial trip limit
   - 6a. 25 lb gutted weight
   - 6a. 50 lb gutted weight
   - 6c. 75 lb gutted weight
   - 6d. 100 lb gutted weight
7. Recreational bag limit of 1 fish per person per day

[1]See Chapter 2 for a more detailed description of the alternatives.
[2]Pounds are in gutted weight.

essentially mixes the estimation of management strategy effects with the management target. This approach was used to establish the ACL for the 2012 emergency opening and was supported by the Southeast Fisheries Science Center because including the 2012 ABC accounts for increased availability as the stock grows. However, the South Atlantic Council reasoned that **Sub-alternatives 2b** and **2c** propose a more intuitive and defensible approach to estimating the appropriate ACL than **Sub-alternative 2a**. The South Atlantic Council stated that the ratio method in **Sub-alternatives 2b** and **2c** provide a better estimator of the effectiveness of the regulations; in **Sub-alternatives 2b** and **2c**, removals increase as the abundance increases, where **Sub-alternative 2a** uses the ABC as the estimator for the following year's total removals. The South Atlantic Council selected **Sub-alternative 2c** as the preferred alternative for setting the red snapper ACL on an annual basis; South Atlantic Council staff advised that evaluating two years of data (**Sub-alternative 2c)** may reduce uncertainty versus one year (**Sub-alternative 2b).**

To establish the beginning of the commercial and recreational fishing season, the South Atlantic Council selected **Sub-alternatives 3a** and **4a**, respectively, as preferred. These alternatives would establish a red snapper commercial fishing season beginning on the second Monday in July. The recreational season would follow, beginning on the second Friday in July. Although the Snapper Grouper AP recommended a September opening for both the commercial and recreational seasons, the South Atlantic Council concluded that a July opening would decrease the chances of inclement weather events, thus promoting safety at sea and increasing the chance of small vessels participating in the fishery. To this end, the South Atlantic Council also requested inclusion of language in **Alternatives 3** and **4** that give the NMFS Regional Administrator authority to delay the opening of red snapper fishing seasons in the event of a tropical storm or hurricane affecting the South Atlantic Council's area of authority. A season beginning in July would also allow for better weather during a second opening, if one were to occur. In addition, the September 2012 opening showed little effort in North Carolina, South Carolina, and Georgia so the South Atlantic Council reasoned that an earlier start date would promote more recreational effort in all the southeastern Atlantic states, and land more of the recreational ACL while allowing more fair and equitable access to red snapper. The South Atlantic Council decided to remain consistent with management measures implemented in 2012 regarding removal of the minimum size limit and the 1 fish per person per day recreational bag limit, and thus also selected **Alternatives 5** and **7** as preferred. The South Atlantic Council chose **Sub-alternative 6c** (75 lbs gw) as their preferred alternative for a commercial trip limit. The commercial trip limit during the 2012 opening was set at 50 lbs gw but only a small portion of the commercial ACL was landed. The South Atlantic Council concluded that a higher trip limit would promote full harvest of the commercial ACL, and help achieve the optimum yield.

The South Atlantic Council concluded the preferred alternatives (**Sub-alternatives 2c**, **3a**, **4a**, **Alternative 5**, **Sub-alternative 6c**, and **Alternative 7**) best meet the purpose of establishing regulations to allow harvest of red snapper without negatively affecting the rebuilding program. The preferred alternatives address the need to increase the socio-economic benefits to fishermen and fishing communities that utilize red snapper while minimizing safety at sea concerns, the probability of overages of the ACL, and discard mortality of red snapper. In addition, the preferred alternatives establish a process that allows the opportunity to collect information on the life history and status of red snapper. The preferred alternatives also best meet the objectives of the Snapper Grouper FMP, as amended, while complying with the requirements of the Magnuson-Stevens Fishery Conservation and Management Act and other applicable law.

Chapter 6. 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 be either 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.

6.1 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 **Section 3.2.1**. **Section 3.1.1** describes the essential fish habitat designation and requirements for species affected by this amendment; additional details are included in **Appendix E**. The most measurable and substantial effects would be limited to the South Atlantic region.

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.

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 associated species.

A. Past

The reader is referred to **Chapter 1 and Appendix F** (History of Management**)** of this document for past regulatory activity for the fish species including amendments to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP). These include bag and size limits, spawning season closures, commercial quotas, gear prohibitions and limitations, area closures, and a commercial limited access system.

Amendment 9 to the Snapper Grouper FMP (Amendment 9; SAFMC 1998) established minimum size limits for yellowtail snapper, red and black grouper, gag, yellowfin and yellowmouth grouper, and scamp; and created a 20-fish aggregate recreational bag limit for snapper grouper species without a bag limit (with the exception of tomtate and blue runner), including yellowtail snapper. The amendment also prohibited the sale and purchase of gag, red porgy and black grouper during March and April; and included gag and black grouper within the 5-fish aggregate grouper bag limit, of which no more than 2 fish could be gag or black grouper (individually or in combination). The South Atlantic Fishery Management Council (South Atlantic Council) approved Amendment 9 at their December 1998 meeting. The final rule published in the *Federal Register* on January 25, 1999, and became effective on February 24, 1999.

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 is prohibited (as is the use of shark bottom longlines), but trolling for pelagic species such as tuna, dolphin, and billfish is 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. 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 included a 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 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.

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 17B at their September 2010 meeting. The final rule published in the *Federal Register* on December 30, 2010, and became effective on January 31, 2011.

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 the 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 included measures to reduce bycatch in the black sea bass pot fishery, modified 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.

Amendment 20A to the Snapper Grouper FMP (Amendment 20A; SAFMC 2011f) 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 final rule for Amendment 20A published in the *Federal Register* on September 26, 2012, and became effective on October 26, 2012.

Regulatory Amendment 12 to the Snapper Grouper FMP (Regulatory Amendment 12; SAFMC 2012a) 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. The Final Rule published in the *Federal Register* on October 9, 2012, and was effective upon publication.

In a letter dated June 19, 2012, the South Atlantic Council requested NMFS 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 *Federal Register* announced the opening of the 2012 commercial and recreational red snapper fishing season in South Atlantic federal waters on August 28, 2012. The commercial red snapper season opened at 12:01 a.m., local time, on September 17, 2012, and closed at 12:01 a.m., local time, on September 24, 2012. . Because the commercial ACL was not met, commercial harvest of red snapper reopened for 8 days beginning November 13, 2012, and for 7 days beginning December 6, 2012. During the open commercial season, the daily trip limit was 50 lbs gw and there was no minimum size limit for red snapper. The recreational fishing season opened for two consecutive weekends made up of Fridays, Saturdays, and Sundays. The recreational red snapper season opened at 12:01 a.m., local time, on September 14, 2012, and closed at 12:01 a.m., local time, on September 17, 2012; the season then reopened at 12:01 a.m., local time, on September 21, 2012, and closed at 12:01 a.m., local time, on September 24, 2012. During the open recreational season, the bag limit was one fish per person per day and there was no minimum size limit for red snapper.

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 the species in this amendment.

The South Atlantic Council has recently completed and is developing amendments for coastal migratory pelagic species, golden crab, dolphin-wahoo, shrimp, and corals/live-hard bottom. 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 (SAFMC 2012c) to the Snapper Grouper FMP was approved by the South Atlantic Council at their June 2012 meeting and considers alternatives addressing golden tilefish. Regulations are expected to be implemented in early 2013. 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 tag program to allow harvest of red snapper as the stock rebuilds. Scoping of Amendment 22 was conducted during January and February 2011. At their September 2012 meeting, the South Atlantic Council stated their intent to further develop Amendment 22 in 2013 focusing on a recreational tag program for red snapper, golden tilefish, snowy grouper, and wreckfish.

At their December 2012 meeting, the South Atlantic Council approved Regulatory Amendment 13 to allow for adjustment of allocations, ACLs, ACTs for select non-assessed snapper grouper species 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, vermilion snapper, hogfish, and red porgy. This amendment will be further developed in 2013.

Regulatory Amendment 15, approved by the South Atlantic Council at their December meeting, would implement a revised ACL for yellowtail snapper based on the latest stock assessment and modify a gag AM and ACL.

The History of Management, **Appendix F**, includes various other amendments in development.

II. Non-Council and other non-fishery related actions, including natural events affecting the species in this amendment

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 that 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 that 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 since they will be incidentally caught when fishermen target other co-occurring species. Red snapper recruitment has been measured from the 1950s 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 has not been detected in the South Atlantic region, and did not likely to pose a threat to the species addressed in this amendment.

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 this amendment is the red snapper. Trends in the condition of red snapper are determined through the Southeast Data, Assessment and Review (SEDAR) process. More information on the SEDAR process and specific information on red snapper are included in **Section 3.2.3**, and is herby incorporated by reference.

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 the 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.

The snapper grouper fishery is a highly regulated fishery; the regulations have affected the resource, ecosystem, and human communities **(Table 6-1).**

Table 6-1. 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-1983	Growth overfishing of 13 species including red snapper	Reduced yield available and increased biological risk
Snapper Grouper FMP 1983	12" red snapper recreational and commercial minimum size limit (SAFMC 1983)	Increased yield per recruit of red snapper
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.
Amendment 4: 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; snappers, excluding vermilion, 10 with no more than 2 red snapper; aggregate grouper bag limit of 5/person/day; and	Reduce mortality of snapper grouper species.

Time period/dates	Cause	Observed and/or Expected Effects
	20" TL red snapper and 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.
Effective Date July 29, 2009	Snapper grouper FMP Amendment 16 (SAFMC 2009a)	Protect spawning aggregations and snapper grouper in spawning condition

Time period/dates	Cause	Observed and/or Expected Effects
		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).	Specified 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 January 31, 2011	Snapper Grouper Amendment 17B (SAFMC 2010b)	Specified 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 June 1, 2011	Regulatory Amendment 10 (SAFMC 2011a)	Removed of snapper grouper area closure approved in Amendment 17A.
Effective Date July 15, 2011	Regulatory Amendment 9 (SAFMC 2011g)	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.
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

Time period/dates	Cause	Observed and/or Expected Effects
		recreational and commercial sectors to their ACTs.
July 11, 2012	Amendment 24 (Red Grouper) (SAFMC 2011e)	Established a rebuilding plan for red grouper, specified ABC, and established ACL, ACT and revised AMs for the commercial and recreational sectors.
Effective Date July 1, 2012	Amendment 18A (SAFMC 2012b)	Established an endorsement program for black sea bass commercial fishery; established a trip limit; specified requirements for deployment and retrieval of pots; made improvements to data reporting for commercial and for-hire sectors
Effective Dates: September 17, 2012 (commercial); September 14, 2012 (recreational)	Temporary Rule through Emergency Action (Red snapper)	Established limited red snapper fishing seasons (commercial and recreational) in 2012.
Effective Date January 7, 2013	Amendment 18A Transferability Amendment	Reconsidered action to allow for transfer of black sea bass pot endorsements that was disapproved in Amendment 18A.
Effective Date October 26, 2012	Amendment 20A (Wreckfish) (SAFMC 2011f)	Redistributed inactive wreckfish shares.
Effective Date October 9, 2012	Regulatory Amendment 12 (SAFMC 2012a)	Adjusted the golden tilefish ACL based on the results of a new stock assessment and modified the recreational golden tilefish AM.
Target 2013	Snapper Grouper Amendment 18B (under review, SAFMC 2012c)	Establish a commercial longline endorsement program for golden tilefish; establish an appeals process; allocate the commercial ACL by gear; establish trip limit for the hook and line sector
Target 2013	Snapper Grouper Amendment 22 (under development)	Develop a recreational tag program for red snapper and deepwater species (snowy grouper, golden tilefish and wreckfish) in the South Atlantic.
Target 2013	Regulatory Amendment 13 (under development)	Adjust ACLs and allocations for unassessed snapper grouper species with MRIP recreational estimates
Target 2013	Snapper Grouper Amendment 27 (under development)	Establish the SAFMC as the managing entity for yellowtail and mutton snappers and Nassau grouper in the Southeast U.S., modify the SG framework; modify placement of blue runner in an FMU or modify management measures for blue runner

Time period/dates	Cause	Observed and/or Expected Effects
Target 2013	Snapper Grouper Amendment 28 (under development; this amendment)	Modify red snapper management measures, including the establishment of a process to determine future annual catch limits and fishing seasons.

9. Determine the magnitude and significance of cumulative effects.

When species in the snapper grouper fishery management unit 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 should be restructured. **Chapters 2** and **4** of this document--which considers a procedure for determining a red snapper ACL, alternatives for a fishing season, and management measures during the fishing season--describe in detail the magnitude and significance of effects of the alternatives considered.

The proposed action would not adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places as these are not in the South Atlantic Exclusive Economic Zone (EEZ). This action is not likely to result in direct, indirect, or cumulative effects to unique areas, such as significant scientific cultural, or historical resources, park land, prime farmlands, wetlands, wild and scenic rivers or ecologically critical areas as the proposed action is not expected to substantially increase fishing effort or the spatial and/or temporal distribution of current fishing effort within the South Atlantic region. The U.S. Monitor, Gray's Reef, and Florida Keys National Marine Sanctuaries are within the boundaries of the South Atlantic EEZ. The proposed actions are not likely to cause loss or destruction of these national marine sanctuaries because the actions, which may establish a short opening for red snapper in the future, are not expected to result in appreciable changes to current fishing practices.

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 actions are, and will continue to be, monitored through collection of data by NMFS, states, stock assessments and stock assessment updates, life history studies, and other scientific observations.

6.2 Socioeconomic

The decision to allow for the harvest of red snapper in South Atlantic waters is likely to have positive social effects, as the closure of this fishery was highly controversial. Public comment

suggested that there were more red snapper than what was reflected in the stock assessment science. The temporary opening, as a result of lower discards, was likely perceived positively and may have had positive economic and social effects. However, the uncertainty that comes from temporary openings and closures does not have positive social effects in the long term. A more permanent management regime is always more acceptable to stakeholders and would likely be seen as responsive to stakeholder concerns. With the establishment of an ACL, commercial fishermen may be able to keep more red snapper that might be discarded otherwise and increased commerce for for-hire fishers and associated businesses may continue. Alternatives to limit the red snapper portion of the snapper grouper fishery are also an attempt to lengthen the fishing season, like alternatives that remove the size limit and establish a commercial trip limit and recreational bag limit. Because the ACL is small, the social effects are affected by the ability of alternatives to establish a fishing season with the longest opening possible. With the establishment of the longest possible fishing season with the largest amount of fish, the social effects should be positive and beneficial in the long term. If an ACL is established and derby fishing occurs which shortens the season and there is an increase in regulatory discards, then the perceived social benefits would not accrue and could be negative in contrast.

Because of the recent overall downturn in the economy, any actions to provide more economic opportunity should have beneficial social effects. The commercial and for-hire sectors of the snapper grouper fishery have seen significant changes in regulatory actions with limited entry and attempts to pursue other types of management that may seem too restrictive (e.g., IFQs). With the recent adoption of annual catch limits (ACLs), early closures of some fisheries are occurring which can change fishing behavior by initiating switching target behavior to other fisheries and adding pressure on other stocks. If those choices are limited, then fishermen are also limited in their flexibility to adapt to regulatory change. Without other options on the water, they may need to make changes in household economics that can have further impacts that extend to the larger community. Much of this discussion is based upon assumption as we do not have enough detailed information on fishermen's businesses or households.

Chapter 7. List of Preparers

Table 7-1. List of preparers of the document.

Name	SAFMC	Title
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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

Table 7-2. List of interdisciplinary plan team members for 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

Chapter 8. Agencies and Persons Consulted

Responsible Agency for EA
NMFS, Southeast Region
263 13th Avenue South
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List of Agencies, Organizations, and Persons Consulted
SAFMC Law Enforcement Advisory Panel
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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