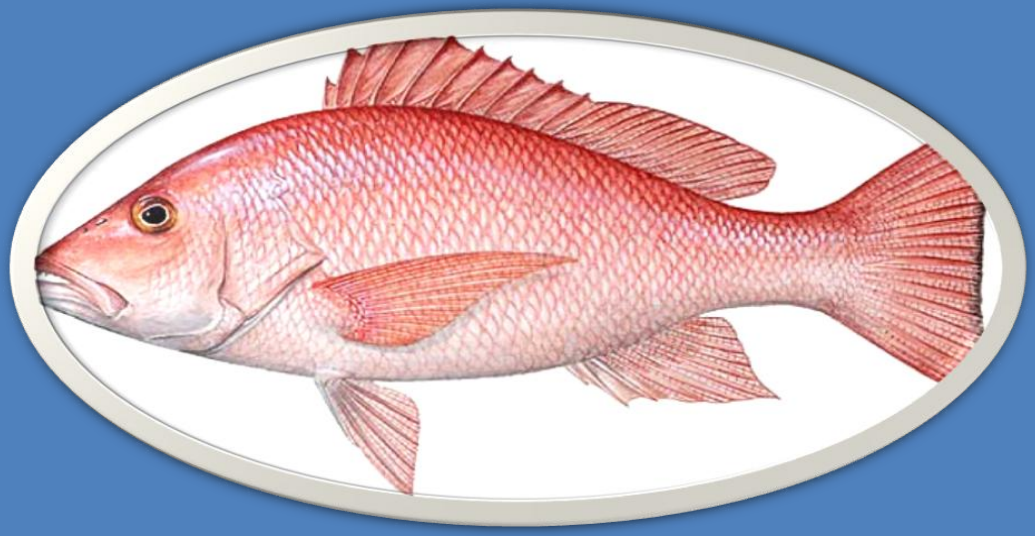

Amendment 28

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

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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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)**.

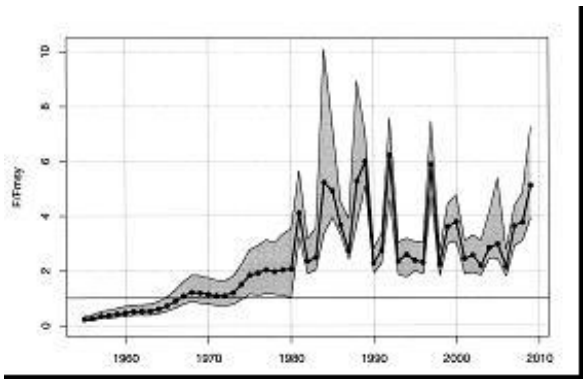


Figure S-1. The overfishing ratio for red snapper over time. The stock is undergoing overfishing when the F/F_{MSY} is greater than one (SEDAR 24 2010).

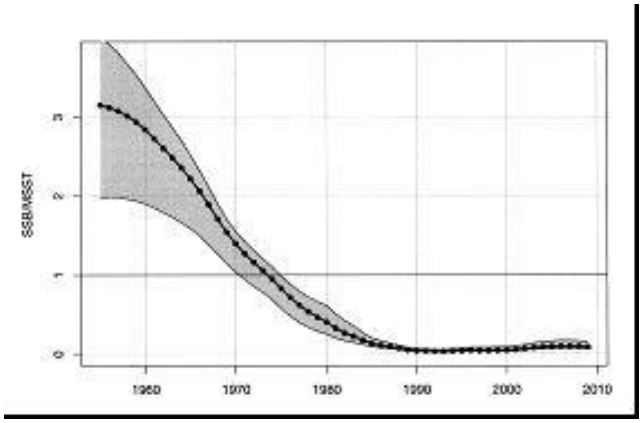


Figure S-2. The overfished ratio for red snapper over time. The stock is overfished when the SSB/MSST is less than one (SEDAR 24 2010).

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?

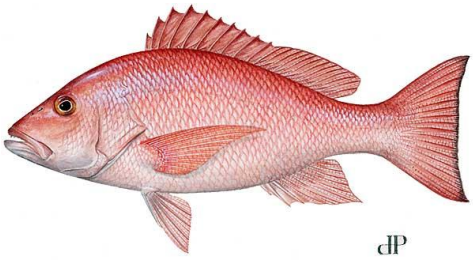
The harvest and possession of red snapper was prohibited on January 4, 2010. In 2012, fishery managers allowed limited harvest of red snapper using a temporary rule through emergency action under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). Through this amendment, 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.

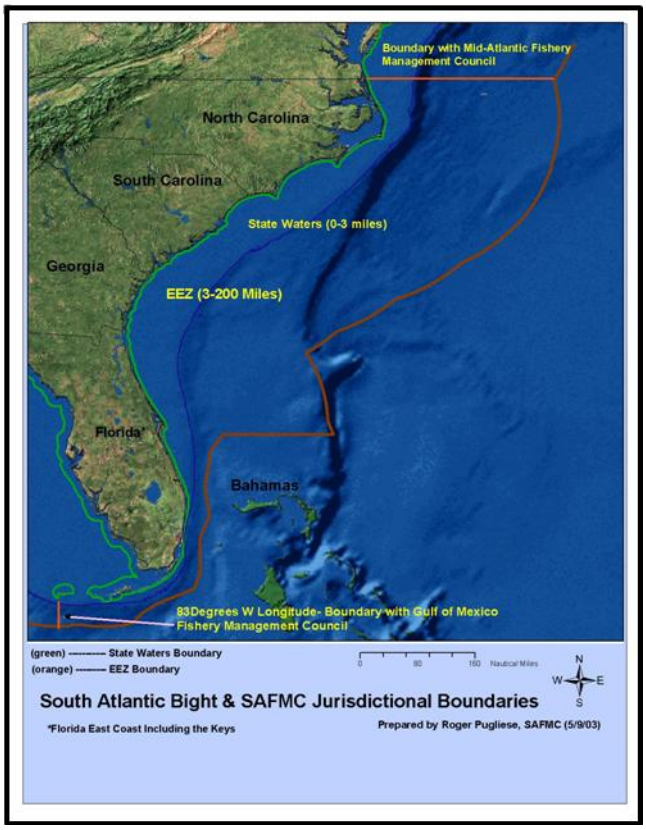


Figure 1-1. Jurisdictional boundaries of the South Atlantic Fishery Management Council.

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).

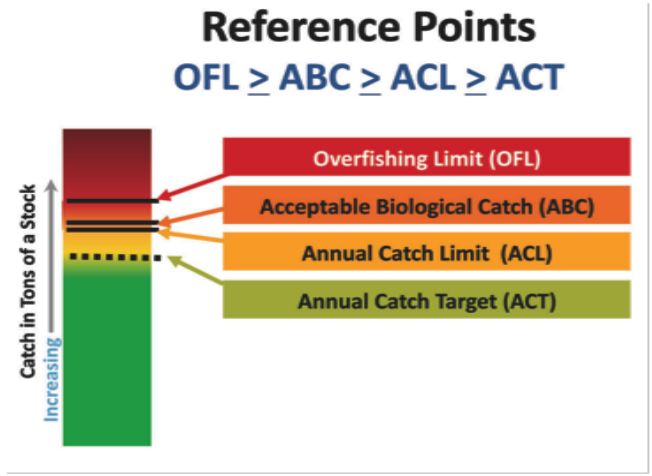


Figure 1-2. The relationship of the reference points to each other.

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.

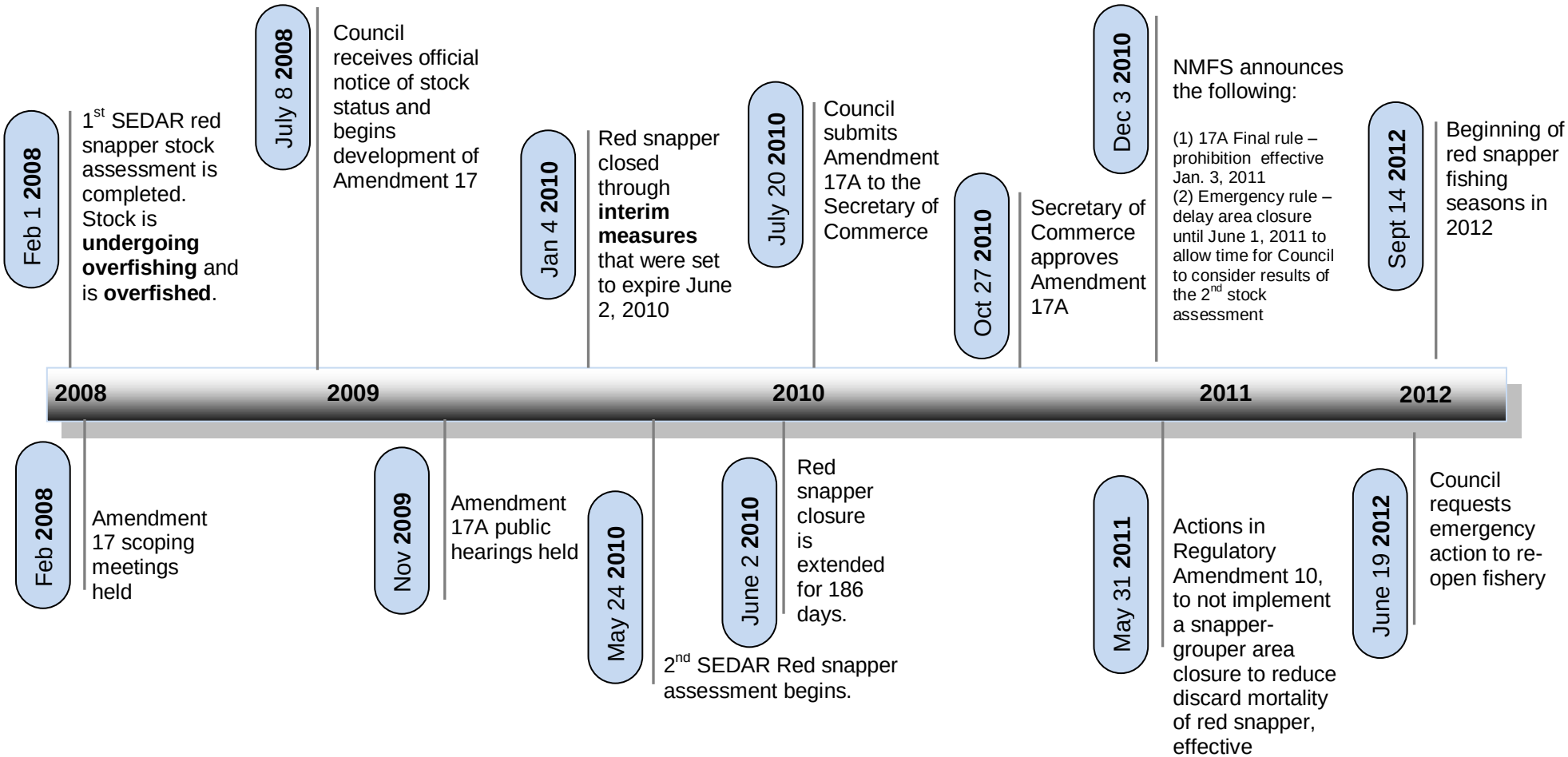


Figure 1-3. Timeline of recent red snapper management measures.

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).

<u>2012 Fishing Season</u>

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.

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

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

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:

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

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

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.

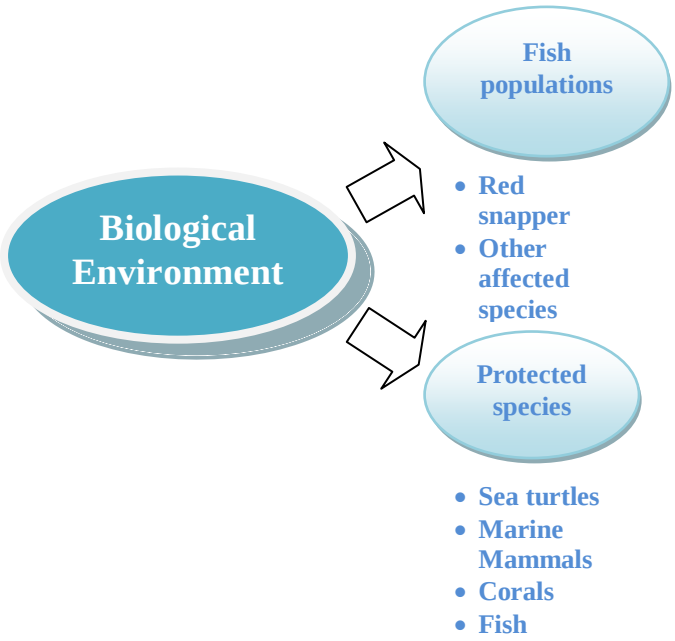


Figure 3-1. Two components of the biological environment described in this document.

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).**

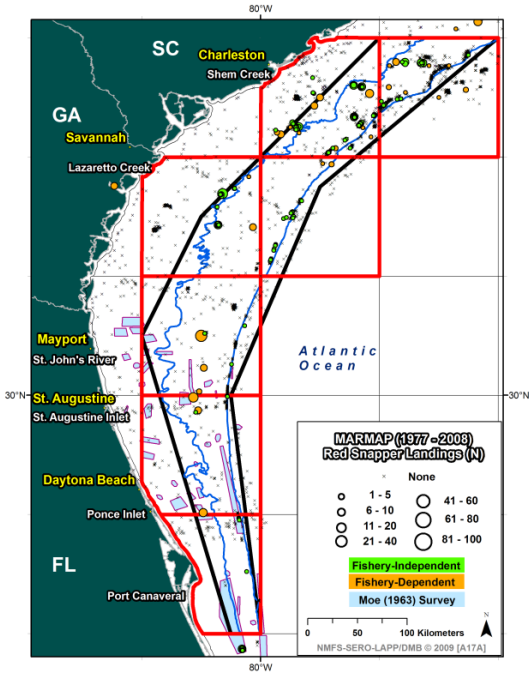
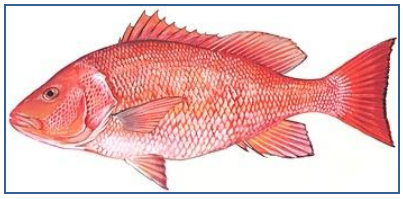


Figure 3-2. Distribution of red snapper taken by MARMAP in fishery-independent and fishery-dependent samples as well as locations where Moe (1963) reported red snapper.

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.

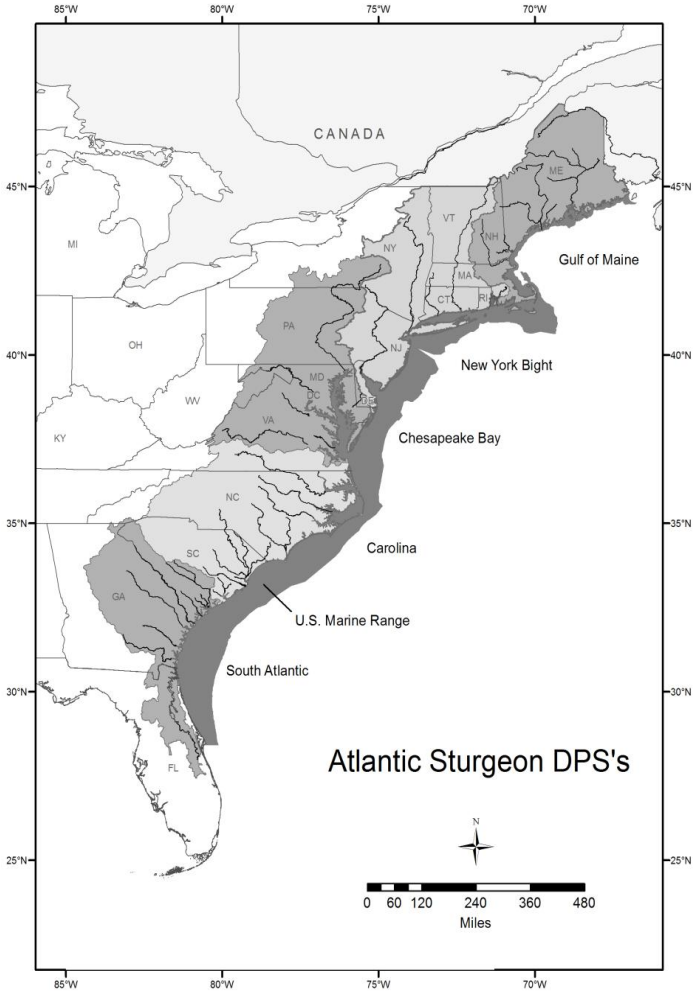


Figure 3-3. Map depicting the five DPSs of Atlantic sturgeon.

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.

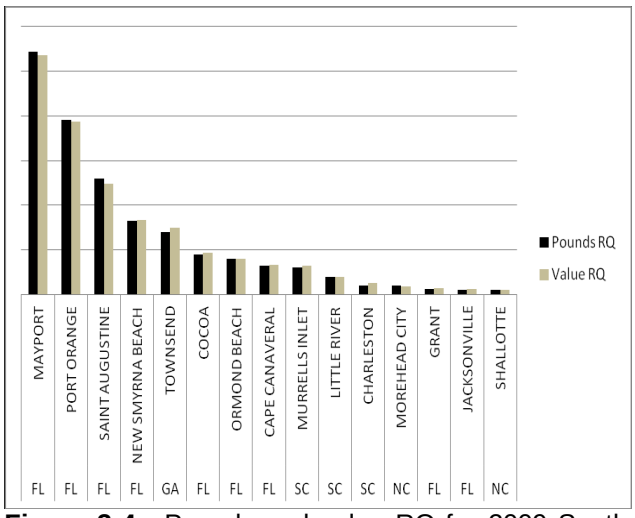


Figure 3-4. Pounds and value RQ for 2009 South Atlantic red snapper

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.

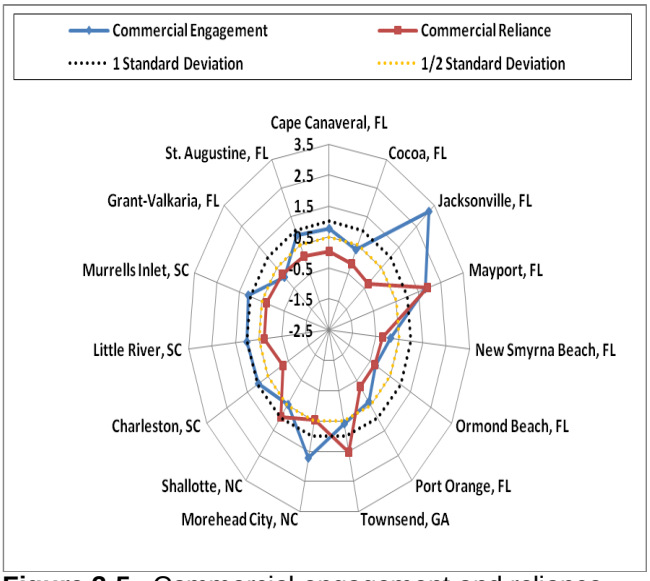


Figure 3-5. Commercial engagement and reliance for South Atlantic red snapper communities.

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.

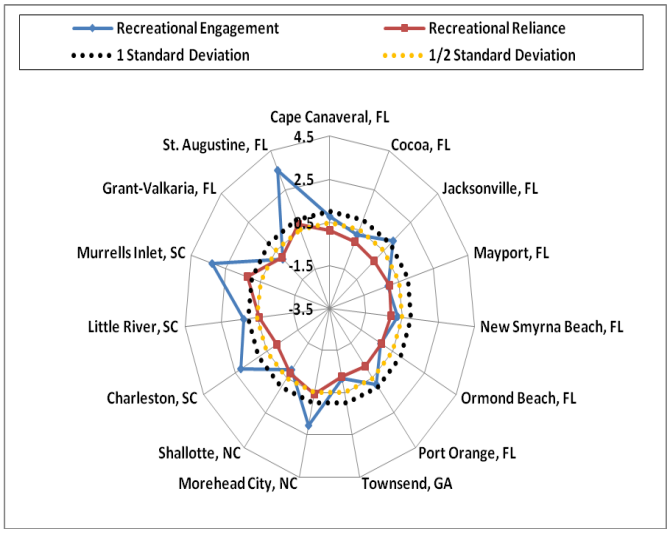


Figure 3-6. Recreational engagement and reliance for South Atlantic red snapper communities.

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.

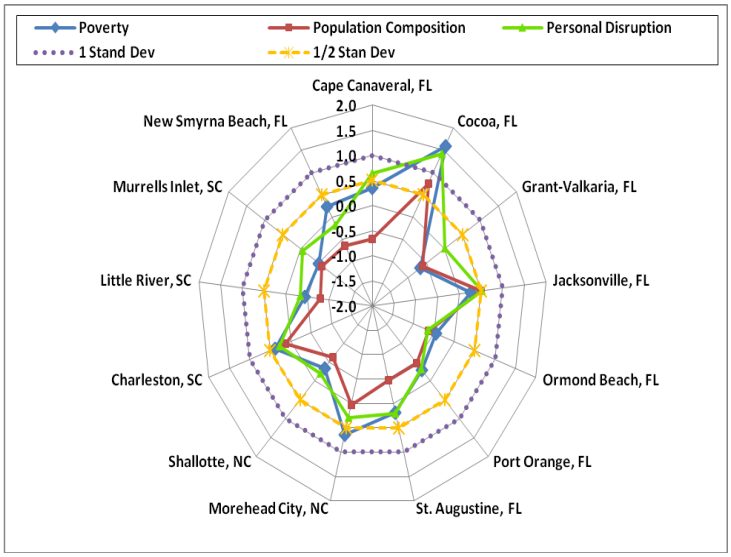


Figure 3-7. Social vulnerability for South Atlantic red snapper communities.

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.

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

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

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

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

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

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

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

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

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 ($estCSR_{2010\text{-}11}$ + 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.

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**
$ABC_{yr\text{-}2}$			65,000
$ABC_{yr\text{-}1}$		64,000	64,000
ABC_{yr}	86,000	86,000	86,000
$estCSR_{yr\text{-}2}$	63,000		63,000
$estCSR_{yr\text{-}1}$	45,000	45,000	45,000
avg ($estCSR_{yr\text{-}2,\ yr\text{-}1}$ + ABC_{2012})	64,667		
$propABC_{yr\text{-}2}$			3.1%
$propABC_{yr\text{-}1}$		29.7%	29.7%
avg $propABC_{yr\text{-}2,\ yr\text{-}1}$			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).**

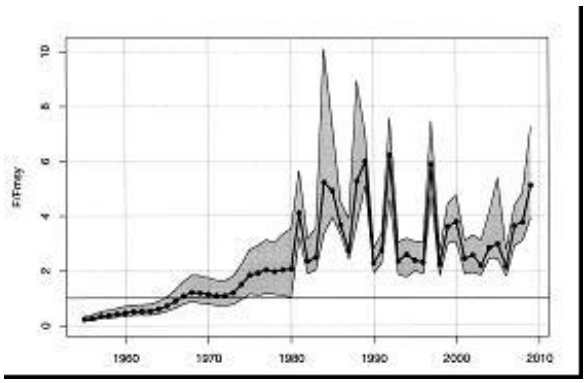


Figure 4-1. The overfishing ratio for red snapper over time. The stock is undergoing overfishing when the F/F_{MSY} is greater than one (SEDAR 24 2010).

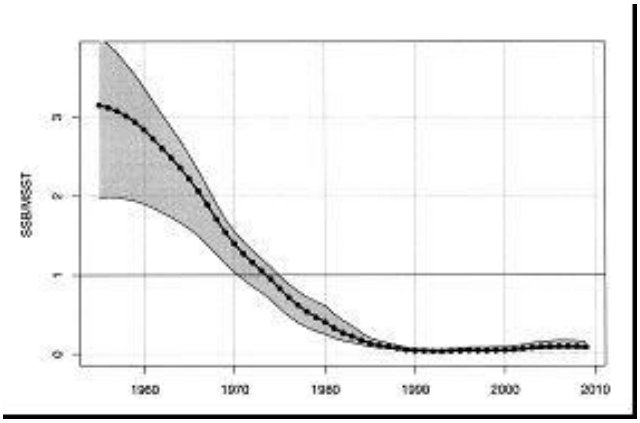


Figure 4-2. The overfished ratio for red snapper over time. The stock is overfished when the SSB/MSST is less than one (SEDAR 24 2010).

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.

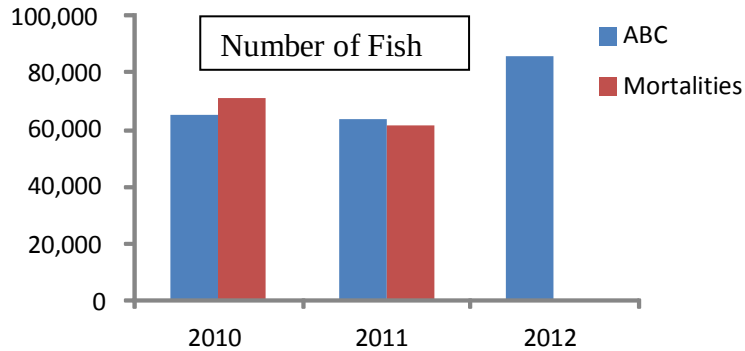
2a. Uses average of 2 prior year's estimated removals + prior years' ABC

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.

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

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.

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

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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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3. Commercial fishing season
   - 3a. Begins 12:01 AM on 2nd Monday in July
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   - 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
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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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   - 6a. 25 lb gutted weight
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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
Myra Brouwer	SAFMC	IPT Lead/Fishery Biologist
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Rick DeVictor	NMFS/SF	IPT Lead/Fishery Biologist
Andy Herndon	NMFS/PR	Fishery Biologist
Mike Jepson	NMFS/SF	Social Scientist
Jack McGovern	NMFS/SF	Fishery Biologist
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Mike Travis	NMFS/SF	Economist

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.

Name	Organization	Title
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Rick DeVictor	NMFS/SF	IPT Lead/Fishery Biologist
Otha Easley	NMFS/LE	Supervisory Criminal Investigator
Nick Farmer	NMFS/SF	Fishery Biologist
Karla Gore	NMFS/SF	Fishery Biologist
Andy Herndon	NMFS/PR	Fishery Biologist (Protected Resources)
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David Keys	NMFS/SER	Regional NEPA Coordinator
Mike Larkin	NMFS/SF	Fishery Biologist
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Monica Smit-Brunello	NOAA/GC	Attorney
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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

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

Chapter 9. References

Allen, G.R. 1985. FAO species catalogue. Vol. 6. Snappers of the world. An annotated and illustrated catalogue of lutjanid species known to date. FAO Fish. Synop. 6(125): 208 pp.

Allman, R. J., G. R. Fitzhugh, and W. A. Fable. 2002. Report of Red Snapper Otolith Ageing; 2000 Data Summary. NMFS, SEFSC, Panama City Laboratory Contribution Series: 02-02. 18 p.

Bigelow, H.B. and W.C. Schroeder. 1953. Sawfishes, guitarfishes, skates and rays, pp. 1-514. *In:* Tee-Van, J., C.M Breder, A.E. Parr, W.C. Schroeder and L.P. Schultz (eds). Fishes of the Western North Atlantic, Part Two. Mem. Sears Found. Mar. Res. I.

Carter, D. and C. Liese. 2012. The Economic Value of Catching and Keeping or Releasing Saltwater Sport Fish in the Southeast USA. North American Journal of Fisheries Management, 32:613-625.

CEQ (Council on Environmental Quality). 1997. Considering Cumulative Effects Under the National Environmental Policy Act. U.S. Council on Environmental Quality, Washington, DC. 64 pp.

Colburn, L.L. and M. Jepson. 2012 Social Indicators of Gentrification Pressure in Fishing Communities: A Context for Social Impact Assessment. Coastal Management 40(3): 289-300.

Dumas, C.F., J.C. Whitehead, C.E. Landry, and J.H. Herstine. 2009. Economic Impacts and Recreation Value of the North Carolina For-Hire Fishing Fleet. North Carolina Sea Grant FRG Grant Report 07-FEG-05.

Goodyear, C.P. 1995. Red snapper in U.S. waters of the Gulf of Mexico. NOAA Contribution: MIA-95/96-05.

Grimes, C.B. 1987. Reproductive biology of the Lutjanidae: a review. Pages 239-294 In J.J. Polovina and S. Ralston (eds.). Tropical snappers and groupers: biology and fisheries management. Westview Press. Boulder, Colorado.

Haab, T.C., R. Hicks, K. Schnier, and J.C. Whitehead. 2009. Angler Heterogeneity and the Species-Specific Demand for Recreational Fishing in the Southeastern United States. Draft Final Report Submitted for MARFIN Grant #NA06NMF4330055.

Hoenig, J. M. 1983. Empirical use of longevity data to estimate mortality rates. Fish. Bull. 82: 898-903.

Holland, S. M., A. J. Fedler, and J. W. Milon. 1999. The Operation and Economics of the Charter and Headboat Fleets of the Eastern Gulf of Mexico and South Atlantic Coasts. University of Florida Office of Research, Technology, and Graduate Education. Report prepared for the National Marine Fisheries Service. Grant Number NA77FF0553.

Holland, S. M., C. Oh, S.L. Larkin, and A.W. Hodges. 2012. The Operations and Economics of For-Hire Fishing Fleets of the South Atlantic States and the Atlantic Coast of Florida. Report prepared for the National Marine Fisheries Service. MARFIN Grant Number NA09NMF4330151.

IPCC, 2007: Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, Pachauri, R.K and Reisinger, A. (eds.)]. IPCC, Geneva, Switzerland, 104 pp.

Jacob, S., P. Weeks, B. Blount, and M. Jepson. 2012 Development and Evaluation of Social Indicators of Vulnerability and Resiliency for Fishing Communities in the Gulf of Mexico. Marine Policy 26(10): 16-22.

Kennedy, V. S., R. R. Twilley, J. A. Kleypas, J. H. Cowan, Jr., and S. R. Hare. 2002. Coastal and Marine Ecosystems & Global Climate Change: Potential Effects on U.S. Resources. Pew Center on Global Climate Change. 52 p.

Liese, C. D.,W. Carter, and R. Curtis. 2009. Surveying the For-Hire Sector: Economic Heterogeneity in the Southeast Charter Boat Industry. Submitted to the Proceedings of the 5th World Recreational Fishing Conference.

MacDonald, L.H. 2000. Evaluating and managing cumulative effects: process and constraints. Environmental Management 26(3): 299-315.

Manooch, C.M., III and J. C. Potts. 1997. Age, growth and mortality of greater amberjack from the southeastern United States. Fish. Res. 30: 229-240.

Manooch, C. S., III, J. C. Potts, M. L. Burton, and D. S. Vaughan. 1998. Population assessment of the vermilion snapper, *Rhomboplites aurorubens*, from the southeastern United States. NOAA Technical Memorandum NMFS–SEFSC–411. 59pp.

McInerny, S. A. 2007. Age and Growth of Red Snapper *Lutjanus campechanus*, From the Southeastern United States. A thesis submitted to the University of North Carolina Wilmington.

Moe, M. A. 1963. A survey of offshore fishing in Florida. Florida State Board of Conservation, Marine Laboratory, Maritime Base (St. Petersburg, FL). Professional Papers Series, No. 4. 117 pp.

NMFS (National Marine Fisheries Service). 2009. "Interim Rule to Reduce Overfishing of Red Snapper in the South Atlantic." NOAA SERO.

NMFS (National Marine Fisheries Service). 2011. "Species groupings for SAFMC Snapper-Grouper FMU" NOAA SERO. SERO-LAPP-2010-06.

NMFS (National Marine Fisheries Service). 2012a. "Measures to Allow Limited Harvest of Red Snapper (*Lutjanus campechanus*) in the South Atlantic in 2012 (Temporary Measures through Emergency Action)" NMFS Southeast Regional Office. 83 pp. plus appendices.

NMFS (National Marine Fisheries Service). 2012b. "South Atlantic Red Snapper Reopening" Southeast Regional Office NMFS Southeast Regional Office. July 6, 2012; addendum added July 30, 2012. SERO-LAPP-2012-04.

Robins, C. R. and G. C. Ray. 1986. A field guide to Atlantic coast fishes of North America. Houghton Mifflin Company, Boston, U.S.A. 354 pp.

Rothschild, B.J. 1986. Dynamics of Marine Fish Populations. Harvard University Press. Cambridge, Massachusetts. 277 pp.

SAFMC (South Atlantic Fishery Management Council). 1983. Fishery Management Plan, Regulatory Impact Review and Final Environmental Impact Statement for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Circle, Suite 306, Charleston, South Carolina, 29407-4699.

SAFMC (South Atlantic Fishery Management Council). 1988. Amendment 1 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Assessment and Regulatory Impact Review. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 63 pp. with appendices.

SAFMC (South Atlantic Fishery Management Council). 1991. Amendment 4 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Assessment, Initial Regulatory Flexibility Analysis, and Regulatory Impact Review. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 243 pp. with appendices.

SAFMC (South Atlantic Fishery Management Council). 1993. Amendment 6 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Assessment, Initial Regulatory Flexibility Analysis, and Regulatory Impact Review. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 161 pp. with appendices.

SAFMC (South Atlantic Fishery Management Council). 1998. Amendment Number 9, Final Supplemental Environmental Impact Statement, Initial Regulatory Flexibility Analysis/Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement for the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Cir., Suite 306, Charleston, S.C. 29407-4699. 246 pp.

SAFMC (South Atlantic Fishery Management Council). 2006. Amendment 13C to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Impact Statement, Biological Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 631 pp. with appendices.

SAFMC (South Atlantic Fishery Management Council). 2007. Amendment 14 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Impact Statement, Biological Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 601 pp. with appendices.

SAFMC (South Atlantic Fishery Management Council). 2008a. Amendment 15A to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Impact Statement, Biological Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 325 pp. with appendices.

SAFMC (South Atlantic Fishery Management Council). 2008b. Amendment 15B to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Impact Statement, Biological Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 324 pp. plus appendices.

SAFMC (South Atlantic Fishery Management Council). 2009a. Amendment 16 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Impact Statement, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 608 pp. plus appendices.

SAFMC (South Atlantic Fishery Management Council). 2009b. Fishery Ecosystem Plan for the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2010a. Amendment 17A to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 385 pp. with appendices.

SAFMC (South Atlantic Fishery Management Council). 2010b. Amendment 17B to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 406 pp. plus appendices.

SAFMC (South Atlantic Fishery Management Council). 2011a. Regulatory Amendment 10 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 101 pp. with appendices.

SAFMC (South Atlantic Fishery Management Council). 2011b. Comprehensive Annual Catch Limit Amendment for the South Atlantic Region with Final Environmental Impact Statement, Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 755 pp. plus appendices.

SAFMC (South Atlantic Fishery Management Council). 2011c. Regulatory Amendment 11 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Assessment, Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 86 pp. plus appendices.

SAFMC (South Atlantic Fishery Management Council). 2011d. Amendment 18A to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Impact Statement, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 292 pp. plus appendices.

SAFMC (South Atlantic Fishery Management Council). 2011e. Amendment 24 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 256 pp. plus appendices.

SAFMC (South Atlantic Fishery Management Council). 2011f. Amendment 20A to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Assessment, Regulatory Flexibility Analysis, Regulatory Impact Review, and Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 128 pp. plus appendices.

SAFMC (South Atlantic Fishery Management Council). 2011g. Regulatory Amendment 9 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Cir., Suite 306, Charleston, S.C. 29407-4699. 185 pp. plus appendices.

SAFMC (South Atlantic Fishery Management Council). 2012a. Regulatory Amendment 12 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 106 pp. plus appendices.

SAFMC (South Atlantic Fishery Management Council). 2012b. Amendment 18A to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Impact Statement, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 238 pp. plus appendices.

SAFMC (South Atlantic Fishery Management Council). 2012c. Amendment 18B to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Impact Statement, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2013. Regulatory Amendment 15 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405.

SEDAR 15. 2008. Stock Assessment Report 1 (revised March, 2009). South Atlantic Red Snapper. Available from the SEDAR website: www.sefsc.noaa.gov/sedar/

SEDAR 24. 2010. Stock Assessment Report. South Atlantic Red Snapper. Available from the SEDAR website: www.sefsc.noaa.gov/sedar/

Scientific and Statistical Committee (SSC) Meeting Report. November 8-10, 2010. Holiday Inn, North Charleston, SC 29405.

Sutton, S.G., R.B. Ditton, J.R. Stoll, and J.W. Milon. 1999. A Cross sectional study and longitudinal perspective on the social and economic characteristics of the charter and party boat fishing industry of Alabama, Mississippi, Louisiana and Texas. Report by the Human Dimensions of Recreational Fisheries Research Laboratory, Texas A&M for NMFS, MARFIN program grant number NA 77FF0551.

Szedlmayer, S. T. and J. D. Lee. 2004. Diet shifts of juvenile red snapper (*Lutjanus campechanus*) with changes in habitat and fish size. Fish. Bull. 102:366–375.

USDOC (U.S. Department of Commerce). 2009. Fisheries Economics of the United States 2006. Economic and Sociocultural Status and Trend Series. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service. 158 pp.

White, D. B. and S. M. Palmer. 2004. Age, growth and reproduction of the red snapper, *Lutjanus campechanus*, from the Atlantic waters of the southeastern United States. Bull. Mar. Sci. 75: 335-360.

South Atlantic Red Snapper Reopening
Southeast Regional Office
SERO-LAPP-2012-04
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Abstract

South Atlantic red snapper has been closed to harvest since January 2010. At the June 2012 South Atlantic Fishery Management Council meeting, the Council reviewed red snapper mortality estimates for 2010 and 2011 and projected mortality estimates for 2012. Estimated mortalities for 2012 were less than projected mortalities and the Council recommended reopening red snapper to harvest in 2012. This report evaluates the amount of fish that could be landed during the reopening and estimates the length of the recreational and commercial fishing seasons. Recreational catch rates for 2012 were predicted using a Seasonal Autoregressive Integrated Moving Average Model, which uses historical monthly landings and projected changes in exploitable abundance to predict future monthly landings. Commercial season lengths were estimated by imposing trip limits of 25 to 100 pounds gutted weight on 2009 logbook data. Both methods do not account for potential increases in fishing effort that may occur due to a short reopening and therefore likely overestimate the length of the season. Allowable landings for 2012 ranged from 2,121 to 19,600 fish. Season lengths were contingent on the amount of fish allowed for harvest. Based on the Council's recommended ACL of 13,067 fish (9,399 recreational/3,668 commercial), recreational fishing season lengths ranged from 11-25 days depending on the month reopened and monthly catch. For the commercial sector, season lengths ranged from 16-175 days depending on the trip limit chosen and start date of the reopening. Given the uncertainties in estimating season length, as well as discard mortalities, and the Council's recommendation to reopen weekends only, it is recommended that the recreational season be reopened no more than 2-3 consecutive three day weekends. For the commercial sector, landings will be monitored in season through the SEFSC's quota monitoring program. Lower trip limits will provide longer seasons and deter targeting of red snapper, while higher trip limits may result in more trips targeting red snapper compared to historic and current effort levels.

Background

The South Atlantic Fishery Management Council (Council) manages red snapper (*Lutjanus campechanus*) in U.S. Atlantic Ocean waters from the Virginia/North Carolina border through the Florida Keys. The SEDAR-24 (2010) benchmark stock assessment of U.S. South Atlantic red snapper determined the stock was undergoing overfishing and was severely overfished (SEDAR-24 2010). On January 4, 2010, NOAA Fisheries Service implemented interim regulations at the request of the Council to close the red snapper segment of the Snapper-Grouper fishery. Interim regulations were implemented to address overfishing until the Council could establish more permanent regulations through Amendment 17A and Regulatory Amendment 10 to the Snapper-Grouper Fishery Management Plan. A complete prohibition of red snapper harvest was necessary to end overfishing and rebuild the stock.

Red snapper has been closed for two and a half years. In April 2012, the Council requested NOAA Fisheries Service's Southeast Fisheries Science Center (SEFSC) provide estimates of mortalities during 2010 and 2011 to determine if red snapper could be reopened. Results were compared to projected mortalities from the SEDAR-24 (2010) stock assessment. At the June 2012 Council meeting, the Council reviewed the mortality data and requested NOAA Fisheries Service implement an emergency rule to

reopen red snapper during 2012. This report evaluates the amount of fish that could be landed during the reopening and provides estimates of how long the recreational and commercial fishing seasons may be open to harvest. Commercial trip limits for reducing the rate of harvest are also evaluated.

Methods

2012 Mortality Estimates

Red snapper discard mortality estimates for 2010 and 2011 were obtained from SEFSC (2012). Results were compared to projected mortalities summarized in Table 9c of SEFSC (2010). Projections summarized in Table 9c were used as the basis for management decisions in Regulatory Amendment 10. Under current data collection protocols, discard mortalities cannot be calculated in-season; thus, discard mortality estimates for 2012 were predicted using four methods:

1. The average of 2010 and 2011 estimated mortalities;
2. The average of 2010 and 2011 estimated mortalities and 2012 projected mortalities;
3. Estimated mortalities for 2011 increased by the change in exploitable abundance projected for 2011 to 2012 and decreased by the change in fishing effort from 2010 to 2011; and,
4. Estimated mortalities for 2011 increased by the change in exploitable abundance projected for 2011 to 2012.

The change in exploitable abundance was obtained from SEDAR-24 (2010) projections (K. Shertzer, SEFSC, personal communication; Figure 1). Projections described in Table 9c of SEFSC (2010) indicate exploitable abundance will increase by 36.6% from 2011 to 2012. Changes in fishing effort were obtained from the Marine Recreational Information Program (MRIP) and from commercial coastal logbook records (Figures 2 and 3). MRIP summarizes effort as angler trips, while commercial logbooks provide days away from port and number of trips. Only recreational fishing effort occurring in the federal economic exclusive zone was used to determine the reduction in fishing effort from 2010 to 2011. Commercial effort was based on trips harvesting any stocks in the Snapper-Grouper Fishery Management Unit. From 2010 to 2011, there was a 7.7% reduction in recreational fishing effort and a 9.1% reduction in the number of days fished by commercial vessels. Reductions in fishing effort (see method 3 above) were applied to sector specific mortality estimates summarized in SEFSC (2012) then increased by the change in exploitable abundance from 2011 to 2012.

The mortality estimates generated from each of the four methods described above were subtracted from the projected mortalities in Table 9c of SEFSC (2010) to determine the number of fish that could be allowed for harvest in 2012. Projected mortalities in 2012 are estimated to equal 86,000 fish (SEFSC 2010). The difference in projected versus estimated mortalities is equivalent to an annual catch limit (ACL) specified in numbers of fish landed. Calculated ACLs in numbers of fish were further allocated 71.93% to the recreational sector and 28.07% to the commercial sector based on the allocation specified in the Council's Comprehensive ACL Amendment (2011). To calculate the commercial ACL in pounds gutted weight, the commercial ACL in numbers of fish was multiplied by the projected average weight of mortalities (in gutted pounds) from Table 9c in SEFSC (2010).

Estimation of Recreational Fishing Season Length

Red snapper landings (in numbers) for 2012 were forecast using a SARIMA model (Box and Jenkins 1976). A SARIMA model analyzes and forecasts equally-spaced univariate time series data, predicting values in a response time series as a linear combination of its own past values, past errors, and past, current, and projected future values of other time series. Because the time series of red snapper recreational catch per month shows strong seasonality, a SARIMA (p,d,q)*(P,D,Q) model was used. The auto-regressive component, designated as p, represents the lingering effects of previous observations. The integrated component, designated as d, represents trends, including seasonality. The moving average component, designated as q, represents lingering effects of previous random shocks (or error). In the SARIMA model, monthly catch (in numbers) of recreational red snapper was projected as a linear combination of past values. The SARIMA model used 2001-2010 red snapper landings. Landings were obtained from the SEFSC's ACL database and aggregated across all modes. Headboat landings are reported on a monthly basis, but Marine Recreational Fisheries Statistical Survey landings are reported by two-month wave. Landings for MRFSS were converted from wave to monthly landings by multiplying wave landings by the ratio of days in a month to total days in the wave.

Exploitable abundance at age was used as a predictive co-variate to account for increasing fish abundance as the stock rebuilds. Abundance at age data were obtained from the most recent red snapper stock assessment and projections (K. Shertzer, SEFSC, pers. comm.) and converted to exploitable abundance using selectivity at age (Figure 1). Projected values of exploitable abundance from projections summarized in Table 9c of SEFSC 2010 ($F=F_{rebuild}$) were used to seed the forecast of the final SARIMA model (K. Shertzer, SEFSC, pers. comm.). It should be noted that the assessment model estimated large increases in exploitable abundance in 2007-2008 due high recruitment progressing through the fishery. Exploitable abundance was estimated to decline from 2008 through 2010 before increasing at a rapid rate beginning in 2011.

The SARIMA model was implemented using Proc ARIMA in SAS v9.2 for Windows (SAS Institute, Inc., Cary, NC). SARIMA model selection was guided by examination of autocorrelations, inverse autocorrelations, partial autocorrelations, and cross-correlations. Stationarity tests were used to guide differencing selection. Residual diagnostics and Akaike Information Criterion (AIC) values were used to select the final model, which was specified as a SARIMA(0,0,1)X(0,1,1)s model where s=12 months, with model fit using conditional least squares. The final model incorporated exploitable abundance as a predictor and explained 66% of the variability in non-seasonal and seasonal trends in monthly catch using an MA(1,1) model (Moving Average Operator: 1 + 0.93028 B**(1)), an SMA(2,1) model at a 12 month lag (Moving Average Operator: 1 - 0.75416 B**(12)), and a predictor term for exploitable abundance (Regression Factor: 0.012651).

Monthly catches predicted by the SARIMA model were then converted to daily catches by dividing the monthly catches by the number of days in the month. Because predictions of catch are highly uncertain and effort may be substantially higher than historic levels if the season is opened for only a short period of time, monthly catches using the upper 95% confidence limit were also generated. A cumulative sum of consecutive daily catch rates was then used to predict how many days it would take to catch the 2012 annual catch limit (ACL). Estimates were generated based on starting the season at the beginning of each month to take into account seasonal changes in landings and fishing effort.

Season lengths were estimated for each of the 2012 ACLs estimated above.

Commercial Trip Limits and Season Length

SEFSC commercial logbook records were used to evaluate how long the commercial fishing season would remain open if various trip limits were imposed. Trip limits were imposed on logbook landings data from 2009, the last year the red snapper commercial sector was open. Trip limits considered ranged from 25 to 100 pounds gutted weight. If a trip reported landing red snapper above a specified trip limit, then landings were reduced to the trip limit. All trips landing quantities of red snapper below the trip limit were increased to the trip limit. Not adjusting landings below a trip limit was considered, but because the Council recommended during their June 2012 meeting to eliminate the minimum size limit, it was presumed that trips previously not catching the trip limit would have a much higher probability of catching the trip limit if the size limit is eliminated. The size limit and geographic availability of red snapper are limiting factors in catching red snapper. By eliminating the size limit, the likelihood of catching the trip limit will increase, especially in the areas of highest abundance, as fish will no longer be discarded due to regulations. Although this might overestimate the amount of fish landed on trips previously occurring, effort may also be underestimated if additional trips occur due to red snapper being reopened.

Results

2012 Mortality Estimates

Red snapper mortality estimates for 2010 and 2011 were comparable to projected mortalities (Figure 4). In 2010, 71,394 red snapper were estimated to be killed (SEFSC 2012). In 2011, 61,405 red snapper were estimated to be killed (SEFSC 2012). Projected mortalities for 2010 and 2011 were 65,000 and 64,000 red snapper, respectively. In 2012, mortalities are projected to increase to 86,000 fish. Estimated mortalities for 2012 ranged from 66,400 to 83,879 fish (Table 1) and varied based on assumed changes in fishing effort, exploitable abundance, and years used to approximate mortalities. Based on the range of projected mortalities, possible ACLs ranged from 2,121 to 19,600 fish (Table 1). The lowest estimate of allowable landings for 2012 assumed mortalities from 2011 to 2012 would increase at the same rate as projected exploitable abundance. The highest estimate of allowable landings assumed mortalities would be on average similar to 2010 and 2011 mortalities.

Estimation of Recreational Fishing Season Length

The SARIMA model explained 66% of the variability in seasonal and non-seasonal monthly catch trends. Model fit was generally very good with the exception of the last four months of 2009, which were overestimated by the model (Figure 5). Estimated mean monthly landings ranged from 11,666-17,591 fish. The upper 95% confidence limit projection estimated monthly landings ranging from 20,177-26,102 fish. Monthly landings were highest during late spring and early summer and lowest during fall and winter.

Projected recreational season lengths for each of the recreational ACLs are summarized in Tables 2 and 3. Based on the mean projected landings from the SARIMA model, the season length ranged from 3-4 days for an ACL = 1,526 fish, 11-17 days for an ACL = 6,462 fish, 16-25 days for an ACL = 9,399 fish, and 24-36 days for an ACL = 14,098 fish. Based on the 95% upper confidence limit projected landings from the SARIMA model, the season length was 2 days for an ACL = 1,526 fish, 7-10 days for an ACL = 6,462

fish, 11-14 days for an ACL = 9,399 fish, and 16-21 days for an ACL = 14,098 fish. Season lengths were longer during fall and winter than spring and summer.

Commercial Trip Limits and Season Length

Tables 4-8 summarize projected commercial red snapper season lengths for various trip limits. As expected, season lengths were longest for lower trip limits and shortest if no trip limit was imposed. Season lengths ranged from as few as 3 days up to 244 days depending on the trip limit and ACL chosen

Discussion

During the June 2012 South Atlantic Council meeting, the Council recommended NOAA Fisheries Service implement emergency regulations to reopen the red snapper segment of the snapper-grouper fishery. Given harvest has been prohibited since January 2010, predicting recreational and commercial fishing season lengths for a limited opening in 2012 is difficult. The Council recommended the following management actions for reopening red snapper:

- Set the 2012 Annual Catch Limit (ACL) for red snapper = 13,067 fish;
- Set the 2012 recreational allocation at 71.93% of the ACL = 9,399 fish;
- Set the 2012 commercial allocation at 28.07% of the ACL = 3,668 fish or 20,818 pounds gutted weight;
- Establish Recreational Accountability Measures (AMs) = track recreational landings and close the recreational sector when the recreational ACL is met or projected to be met;
- Establish Commercial Accountability Measures (AMs) = track commercial landings and close the commercial sector when the commercial ACL is met or projected to be met;
- Allow for the recreational ACL to be landed during 3-day weekends (Fri-Sun) the number of which would be determined by the agency and the opening dates would be subject to modification based on weather conditions;
- Open the season as soon as possible;
- Set the recreational bag limit at 1 fish per person per day with no size limit;
- Open the commercial season in 7-day mini-season increments subject to the remaining quota; and,
- Allow for the commercial ACL to be landed under a 50-pound trip limit with no size limit.

Predicting changes in angler behavior in response to a reopening is difficult. Many factors can influence fishing activity including: fuel costs and trip expenses, weather (Figure 6, SERO 2012a), changes in regulations, changes in fishing behavior, and conflicting activities (e.g., family activities, sporting events on weekends). It is difficult to predict how South Atlantic fishermen will respond to a 'derby-style' opening of red snapper. Although the recreational red snapper sector in the Gulf of Mexico has never been completely closed, the fishing season has been shortened in each of the last five fishing years. Despite reductions in the fishing season length, the average catch-per-day has increased at a linear rate (Figure 7), due in large part to increases in stock abundance, increases in the average size of fish caught, and effort compensation (SERO 2012b). During 2011, recreational anglers landed approximately the same amount of red snapper in 48 days (in pounds) as they did during 2006 and prior when the season was 194 days.

In this analysis, historical South Atlantic red snapper landings data were forward-projected based on increases in exploitable abundance and used to estimate future monthly recreational catch rates. Although this approach accounts for changes in underlying stock size and seasonal dynamics in fishing pressure, it does not factor in changes in fishing pressure likely from a shortened season. However, even this approach may underestimate fishing effort and landings resulting from a short 'derby-style' reopening of red snapper. If effort is underestimated, then season lengths predicted in this report would be too long and would result in an overage of the ACL.

Maximum recreational season lengths ranged from 11-25 consecutive days based on the Council's recommended ACL of 13,067 fish. As the majority of private recreational fishing pressure occurs on weekends, the number of weekend days available would be much less than the 11-25 consecutive days projected. For example, 11-25 consecutive days is the equivalent of 1.6-3.6 weeks. Assuming 75% of a week's recreational landings are landed over the three-day weekend, 2.1-4.8 three-day weekends would be the equivalent of 11-25 consecutive days. Given uncertainties in estimated discard mortalities for 2012, and the potential for large shifts in fishing effort, it is recommended that the recreational fishing season be no longer than 2-3 consecutive three-day weekends.

For the commercial sector, fishing season lengths were highly variable and contingent on the trip limits chosen and the amount of trips made during a week/month. Lower trip limits would result in the longest fishing season and would limit direct targeting of red snapper while reducing wasteful dead discards. Higher trip limits would result in more trips directly targeting red snapper. Based on the Council's preferred commercial ACL (3,668 fish or 20,818 gutted pounds) and trip limit (50 pounds gutted weight), it is estimated the season length could be 2-3 months. This assumes effort is comparable to 2009 levels. In 2009, 1,997 logbook trips reported landing red snapper. Trips per month ranged from 113-235, or approximately 30-60 per week. During 2009, the maximum amount of pounds landed during a week was 21,423 pounds gutted weight between October 3-9, 2009. This amount was landed by 44 vessels taking 60 trips. Logbook records indicate there were 107 vessels fishing in statistical zones from Central-east Florida (Fort Pierce/Cape Canaveral) through Georgia in 2011 that landed species commonly associated with red snapper (i.e., vermilion snapper, scamp, red porgy, black grouper, gag, red grouper, gray triggerfish, and greater amberjack). Most trips occurred off Florida and averaged 2-3 days (Figure 8). If each of these vessels made two trips per week and caught a 50 pound trip limit, then the season would be open 14 days. If these vessels each made three trips per week and caught a 50 pound trip limit, then the season would be open 9 days. Given that vessels off South Carolina and North Carolina will also be catching some red snapper, it is likely the season could be even shorter than 9-14 days.

Quota monitoring by the SEFSC will allow commercial landings to be monitored during and after the 7-day opening(s). Once landings have been reported for the first seven-day commercial opening, the SEFSC will evaluate if the ACL has been met. If the ACL is not met, the season will be reopened for an additional 7 days or less if the quota is met sooner. Given the potential for large shifts in fishing effort, lower trip limits will reduce the risk of exceeding the ACL during these 7-day mini-season openings.

References

SAFMC. 2011. Comprehensive annual catch limit amendment for the South Atlantic region. South Atlantic Fishery Management Council, Charleston, SC. 755 pp.

SEDAR-24. 2010. Stock Assessment Report: South Atlantic red snapper. Southeast Data, Assessment, and Review, Charleston, SC. 524 pp.

SEFSC. 2010. SEDAR-24 South Atlantic red snapper: Management quantities and projections requested by the SSC and SERO. NOAA Fisheries Service, Southeast Fisheries Science Center, Beaufort, NC. 15 pp.

SEFSC. 2012. South Atlantic red snapper: Estimated mortalities in 2010 and 2011. NOAA Fisheries Service, Southeast Fisheries Science Center, Beaufort, NC. 6 pp.

SERO. 2012a. Extension of the Gulf of Mexico recreational red snapper fishing season. NOAA Fisheries Service, Southeast Regional Office, St. Petersburg, FL. 13 pp.

SERO. 2012b. 2012 Recreational red snapper quota closure analysis. NOAA Fisheries Service, Southeast Regional Office, St. Petersburg, FL. 17 pp.

Table 1. Estimated discard mortalities for 2012 and potential allowable landings allocated to each sector.

Method for Estimating 2012 Discard Mortalities	2012 Discard Mortalities (n)		Potential Allowable Landings (n) / ACL
	Projected	Estimated	
2010-11 average mortalities	86,000	66,400	19,600 rec = 14,098 comm = 5,502 or 31,226 lbs gw
Average of 2010-11 estimated mortalities and 2012 projected mortalities	86,000	72,933	13,067 rec = 9,399 comm = 3,668 or 20,818 lbs gw
2011 mortalities increased by Δ in 2011-2012 exploitable abundance and decreased by Δ in 2010-2011 fishing effort	86,000	77,016	8,984 rec = 6,462 comm = 2,522 or 14,313 lbs gw
2011 increased by Δ in 2011-2012 exploitable abundance (36.6%)	86,000	83,879	2,121 rec = 1,526 comm = 595 or 3,379 lbs gw

Table 2. Estimated recreational red snapper fishing season length based on mean monthly 2012 landings projected by the SARIMA model. 'Month' refers to when the season would be reopened.

Month	Estimated Recreational Season Length (SARIMA mean)			
	ACL = 1,526	ACL = 6,462	ACL = 9,399	ACL = 14,098
Jan	3	14	20	31
Feb	3	11	16	24
Mar	3	12	17	26
Apr	3	12	17	25
May	3	11	17	25
Jun	3	11	16	24
Jul	3	14	20	30
Aug	3	14	21	31
Sep	4	17	24	36
Oct	4	17	25	36
Nov	4	16	23	34
Dec	4	16	23	34

Table 3. Estimated recreational red snapper fishing season lengths based on 95 percent upper confidence limit of monthly 2012 landings projected by the SARIMA model. ACLs are in numbers of fish and are based on results summarized in Table 1. 'Month' refers to when the season would be reopened.

	Estimated Recreational Season Length (SARIMA 95% CL)			
Month	**ACL = 1,526**	**ACL = 6,462**	**ACL = 9,399**	**ACL = 14,098**
Jan	2	9	13	19
Feb	2	7	11	16
Mar	2	8	11	17
Apr	2	8	11	17
May	2	8	11	17
Jun	2	7	11	16
Jul	2	9	13	19
Aug	2	9	13	19
Sep	2	10	14	21
Oct	2	10	14	22
Nov	2	9	13	20
Dec	2	10	14	21

Table 4. Estimated commercial red snapper fishing season lengths based on 2009 logbook landings data and a 25-pound gutted weight trip limit. ACLs are in gutted pounds and are based on results summarized in Table 1. 'Month' refers to when the season would be reopened.

	Estimated Season Length (25 lb gw trip limit)			
Month	**ACL = 3,379**	**ACL = 14,313**	**ACL = 20,818**	**ACL = 31,226**
Jan	26	122	162	229
Feb	25	118	152	227
Mar	36	105	150	223
Apr	30	94	141	210
May	22	86	135	198
Jun	17	92	135	214
Jul	23	100	143	229
Aug	27	99	152	240
Sep	22	96	152	244
Oct	22	107	156	244
Nov	23	112	175	237
Dec	33	126	175	236

Table 5. Estimated commercial red snapper fishing season lengths based on 2009 logbook landings data and a 50-pound gutted weight trip limit. ACLs are in gutted pounds and are based on results summarized in Table 1. 'Month' refers to when the season would be reopened.

	Estimated Season Length (50 lb gw trip limit)			
Month	**ACL = 3,379**	**ACL = 14,313**	**ACL = 20,818**	**ACL = 31,226**
Jan	13	54	88	131
Feb	13	64	92	125
Mar	19	67	89	116
Apr	15	55	73	102
May	11	43	60	96
Jun	9	39	61	101
Jul	12	52	75	109
Aug	13	52	73	108
Sep	11	47	68	109
Oct	11	47	73	117
Nov	11	57	83	123
Dec	17	62	86	138

Table 6. Estimated commercial red snapper fishing season lengths based on 2009 logbook landings data and a 75-pound gutted weight trip limit. ACLs are in gutted pounds and are based on results summarized in Table 1. 'Month' refers to when the season would be reopened.

	Estimated Season Length (75 lb gw trip limit)			
Month	**ACL = 3,379**	**ACL = 14,313**	**ACL = 20,818**	**ACL = 31,226**
Jan	9	37	53	88
Feb	8	39	62	92
Mar	12	48	66	89
Apr	10	39	54	73
May	7	31	42	60
Jun	6	22	37	61
Jul	8	33	50	75
Aug	9	37	51	73
Sep	7	31	45	68
Oct	7	31	46	73
Nov	8	33	55	83
Dec	11	44	60	86

Table 7. Estimated commercial red snapper fishing season lengths based on 2009 logbook landings data and a 100-pound gutted weight trip limit. ACLs are in gutted pounds and are based on results summarized in Table 1. 'Month' refers to when the season would be reopened.

	Estimated Season Length (100 lb gw trip limit)			
Month	**ACL = 3,379**	**ACL = 14,313**	**ACL = 20,818**	**ACL = 31,226**
Jan	7	28	40	59
Feb	6	26	44	70
Mar	9	38	52	72
Apr	8	31	42	59
May	6	25	33	47
Jun	4	14	27	43
Jul	6	24	37	57
Aug	7	29	40	56
Sep	6	23	34	51
Oct	5	23	34	51
Nov	6	22	38	63
Dec	8	34	47	67

Table 8. Estimated commercial red snapper fishing season lengths based on 2009 logbook landings data and no trip limit. ACLs are in gutted pounds and are based on results summarized in Table 1. 'Month' refers to when the season would be reopened.

	Estimated Season Length (no trip limit)			
Month	**ACL = 3,379**	**ACL = 14,313**	**ACL = 20,818**	**ACL = 31,226**
Jan	4	16	24	36
Feb	4	17	25	40
Mar	5	22	32	45
Apr	4	18	26	39
May	4	19	27	39
Jun	4	15	22	33
Jul	3	13	20	29
Aug	6	24	35	46
Sep	4	18	26	35
Oct	3	11	16	25
Nov	4	16	24	36
Dec	4	18	26	39

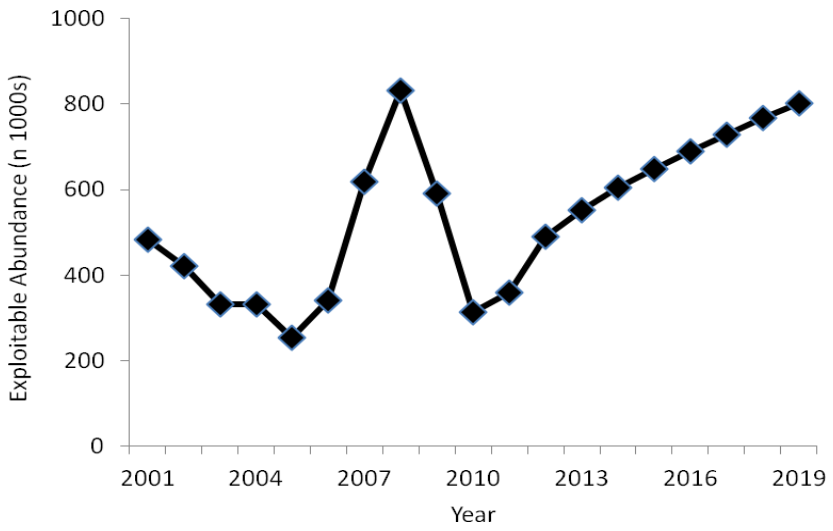

Figure 1. Red snapper exploitable abundance (thousands o f fish), 2001-2019.

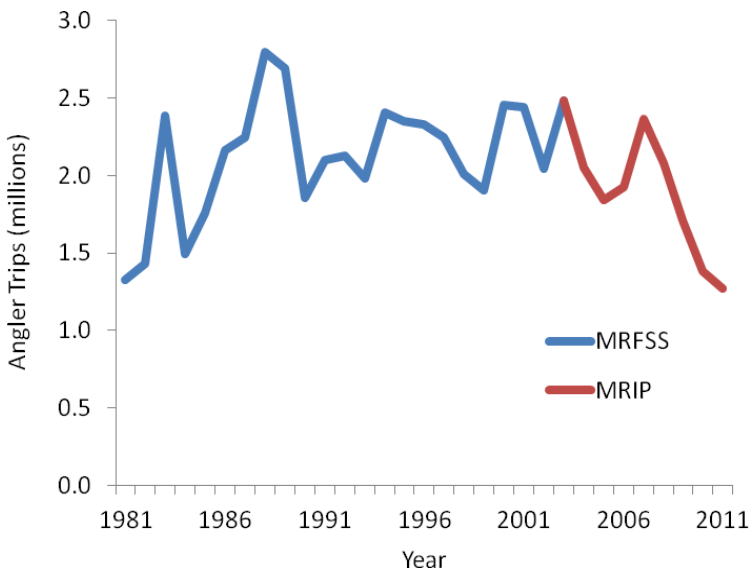

Figure 2. Recreational angler trips in federal waters of the South Atlantic, 1981-2011. Angler trips were estimated using the Marine Recreational Fisheries Statistics Survey from 1981-2003. From 2004-2011, angler trips are estimated based on Marine Recreational Information Program methods.

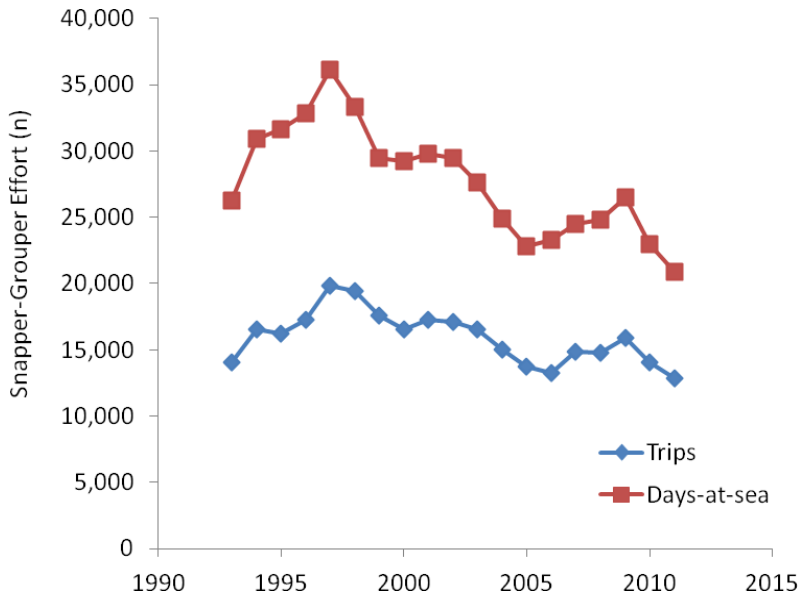

Figure 3. Snapper-grouper commercial fishing trips and days-at-sea, 1993-2011. Source: Coastal logbook records.

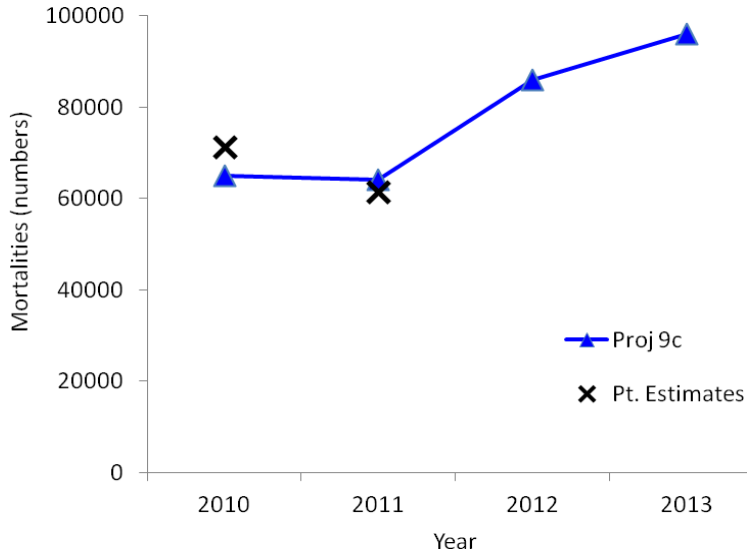

Figure 4. Projected (blue triangles) and estimated (black x) red snapper mortalities, 2010-2013. Projected mortalities are from Table 9c in SEFSC (2010). Estimated mortalities are from SEFSC (2012).

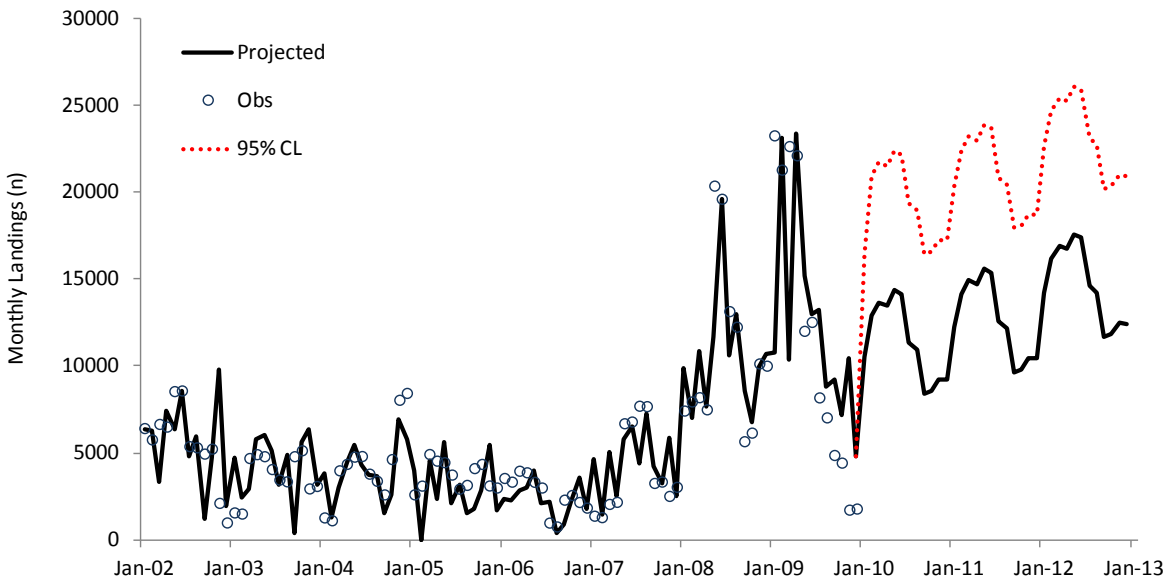

Figure 5. SARIMA model fit to recreational landings-per-month (in numbers). Red dashed line represents 95% upper confidence limit. Monthly landings are projected for 2010 through 2012.

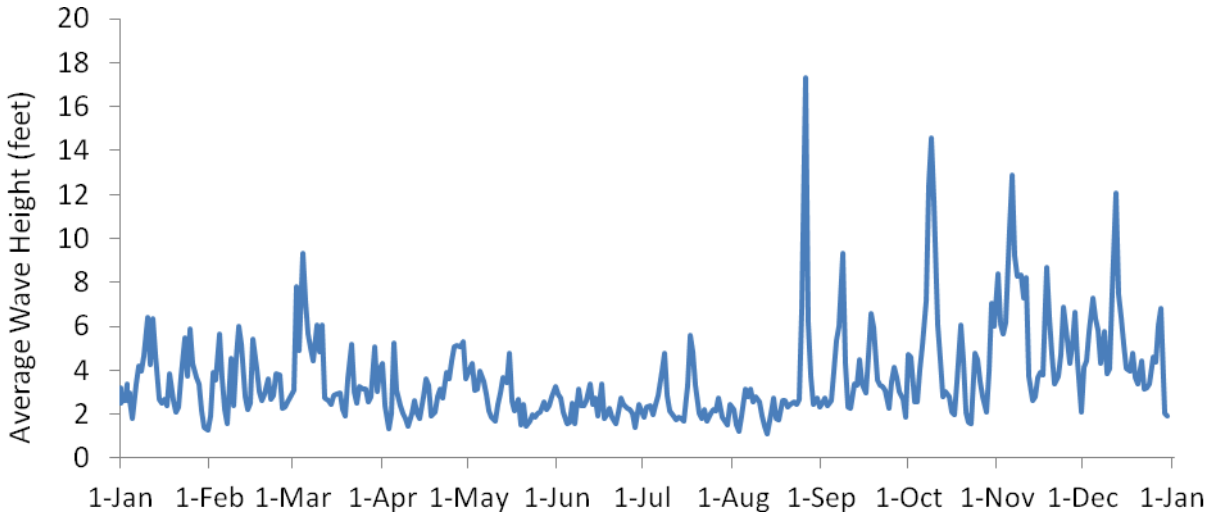

Figure 6. Average daily wave heights (feet) during 2011 at buoy 41012, east of St. Augustine, Florida. Source: www.ndbc.noaa.gov

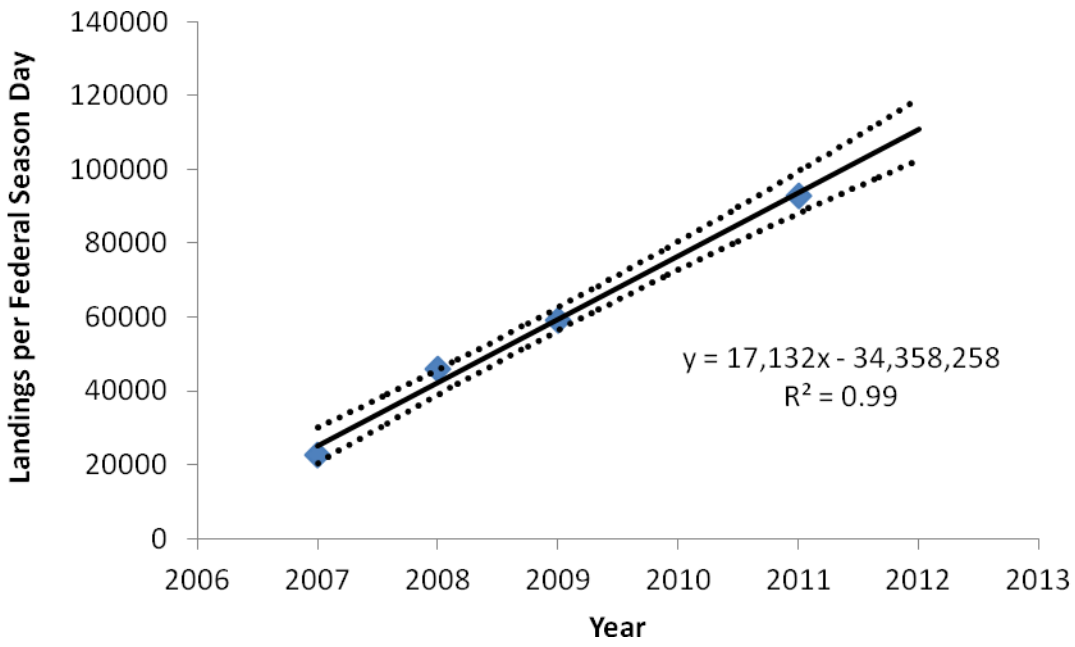

Figure 7. Linear regression (± 80% confidence limits) of Gulf of Mexico red snapper landings per federal season day versus year, 2007-2011 (excluding 2010 due to Deepwater Horizon oil spill).

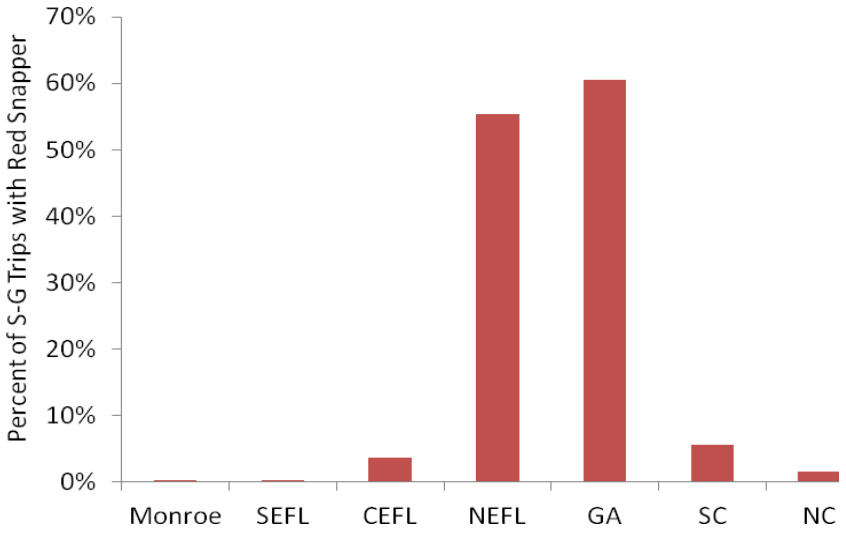

Figure 8. Percentage of snapper-grouper fishing trips in 2009 landing red snapper by state/region. Monroe = Florida Keys, SEFL = West Palm Beach-Miami, CEFL = Cape Canaveral – Fort Pierce, NEFL = Jacksonville – St. Augustine)

ADDENDUM

At the June 2012 South Atlantic Fishery Management Council (Council) meeting, the Council reviewed estimated 2012 red snapper mortalities summarized in Table 1 of this report. The Council selected an annual catch limit (ACL) for red snapper of 13,067 fish. This ACL was based on the difference in projected 2012 mortalities from Table 9c of SEFSC (2010) relative to the average of 2010-11 estimated mortalities and 2012 projected mortalities. Since the June Council meeting, the Southeast Regional Office and Southeast Fisheries Science Center have reviewed additional discard and effort data for 2012 to further evaluate whether or not discard mortalities in 2012 will be less than projected mortalities to determine if reopening the red snapper segment of the snapper-grouper fishery is justified.

Red snapper discard estimates from the Marine Recreational Information Program (MRIP) and Marine Recreational Fisheries Statistics Survey (MRFSS) were obtained for waves 1-2 (January-April) in 2010-2012 (Table A1). Discards estimated through the shore mode were excluded consistent with SEDAR-24 (2010). Dead discards were calculated by multiplying discards by mode-specific mortality rates from SEDAR-24 (i.e., 0.39 for private/rental and 0.41 for charter). No data were available to evaluate commercial or headboat red snapper mortalities for 2012.

Table A1. Discard and dead discard estimates from MRIP and MRFSS waves 1-2, 2010-2012.

	MRFSS (waves 1-2)		**MRIP (waves 1-2)**	
Year	**Discards (n)**	**Dead Discards (n)**	**Discards (n)**	**Dead Discards (n)**
2010	21,312	8,315	24,536	9,577
2011	3,186	1,259	5,842	2,294
2012	6,154	2,407	5,707	2,270

MRFSS discard estimates were higher than 2011 estimates but well below discard estimates for 2010. MRIP discard and dead discard estimates were comparable to 2011 estimates and much lower than 2010 estimates. There does not appear to be a significant change in discards for the first four months of 2012. Given that discard estimates are low and in-line with last year using MRIP and slightly higher, but still low under MRFSS, there is no evidence at this time to indicate mortalities will be higher than the amount assumed by the Council when setting the ACL. Even though MRFSS discard estimates are up for 2012 relative to 2011, they are still much lower than 2010. Total mortalities in 2010 and 2011 (see SEFSC 2012; 71,394 fish in 2010 and 61,405 fish in 2011) were both below the assumed level of total mortalities for 2012 (i.e., 72,933) selected by the Council for setting the ACL.

NOAA Fisheries Service also reviewed MRIP effort data to evaluate effort relative to prior years. MRIP estimates angler trips by state, area, wave, and mode. Angler trips for the South Atlantic Exclusive Economic Zone (EEZ) were extracted for waves 1-2, 1983-2012, and for waves 1-6, 1983-2011 (Figure A1). Effort in the South Atlantic EEZ generally declined from 2003-2011. Total and wave 1-2 EEZ angler trips in 2011 were the lowest on record. In 2012, wave 1-2 EEZ angler trips were the third lowest since 1983. Angler trips in waves 1-2 increased in 2012 relative to both 2010 and 2011 angler trips. Angler trips during the first two waves in 2012 were 47.7% higher than 2011 and 18.9% higher than 2010. Charter angler trips for waves 1-2 in 2012 were lower than 2010 and 2011 levels (23,255 trips vs. 30,060

in 2010 and 17,498 in 2011), while private angler trips were higher than 2010 and 2011 levels (316,384 trips vs. 257,387 in 2010 and 195,961 in 2011).

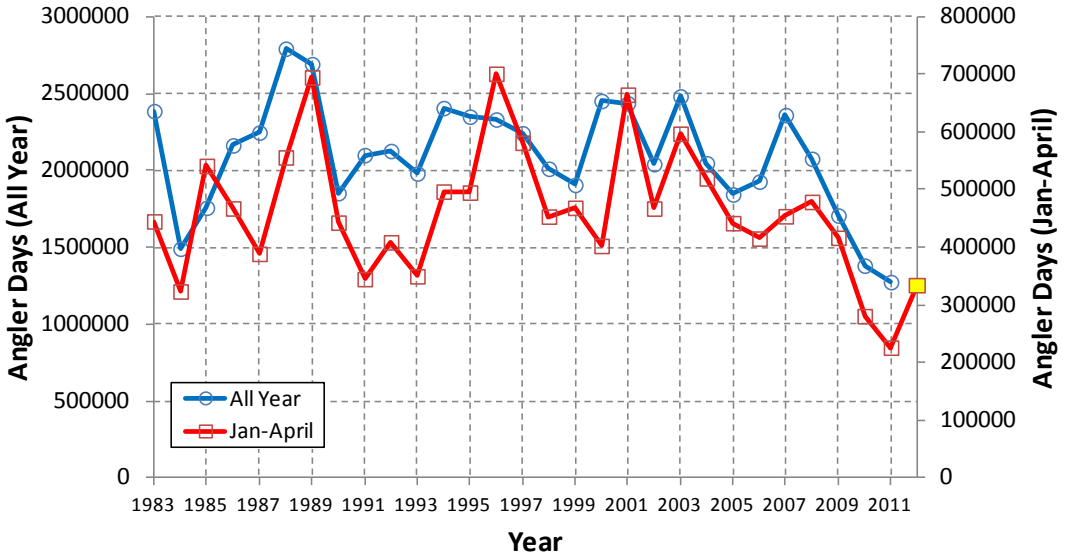

Figure A1. MRIP angler trips in South Atlantic federal waters.

In conclusion, discard estimates for waves 1-2, 2012, are comparable to previous estimates in 2010 and 2011. There appears to be no evidence based on data through April that discards are increasing in 2012. Despite increases in private fishing effort during waves 1-2, 2012, discards have remained low and comparable to previous years. Several reasons may explain the low number of discards including, but not limited to: 1) fishermen avoiding red snapper and other snapper-grouper due to regulatory restrictions, 2) discards being underreported or underestimated by MRFSS and MRIP, 3) effort being overestimated by MRIP, or 4) increases in exploitable abundance being lower than previously projected.

Appendix B.

1 Bycatch Practicability Analysis (BPA)

1.1 Population Effects for the Bycatch Species

Background

In 2008, a stock assessment for red snapper indicated the red snapper stock was overfished and undergoing overfishing (Southeast Data, Assessment, and Review (SEDAR 15; 2008a). Consequently, an interim rule was published on December 4, 2009 (NOAA's National Marine Fisheries Service (NMFS) 2010), which prohibited harvest and possession of red snapper beginning on January 4, 2010. That rule was extended for 186 days. A new benchmark assessment completed in 2010, further confirmed that red snapper is experiencing overfishing and is overfished (SEDAR 24 2010b). Amendment 17A to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP) (Amendment 17A; SAFMC 2010a), effective December 3, 2010, continued the harvest and possession prohibition of red snapper to end overfishing and also implemented a rebuilding plan. **Appendix R** of Amendment 17A contains the BPA conducted for that amendment, and is incorporated herein by reference. At their June 2012 meeting, the South Atlantic Fishery Management Council (South Atlantic Council) reviewed red snapper discard mortality estimates and compared them to the 2012 acceptable biological catch (ABC) from the rebuilding projection, which resulted from SEDAR 24 (2010b) and were recommended by the South Atlantic Council's Scientific and Statistical Committee. The estimated mortalities for 2012 were less than the ABC for 2012 suggesting some minimal level of harvest of red snapper could occur without negatively affecting the stock (**Appendix B** of NMFS 2012). As a result, the South Atlantic Council recommended reopening red snapper to a small amount of harvest in 2012.

With the exception of a limited opening in 2012, harvest of red snapper in federal waters has been prohibited since January 4, 2010. There has been some very small harvest of red snapper in Florida state waters since they did not adopt compatible regulations. However, most of the mortality, in the form of dead discards, has occurred as incidental catch of red snapper from fishermen targeting co-occurring species. Amendment 17A indicates the top co-occurring species with red snapper are vermilion snapper, gag, scamp, greater amberjack, gray triggerfish, black sea bass, and red grouper. The Southeast Fisheries Science Center (SEFSC) has provided a report on the level of harvest and dead discards of red snapper in 2010 and 2011, which is contained in **Appendix B** of NMFS 2012.

The directed commercial snapper grouper fishery top co-occurring species with red snapper (vermilion snapper, gag, scamp, greater amberjack, gray triggerfish, black sea bass, and red grouper) is executed primarily with hook and line gear (Table 1). Table 1 from **Appendix R** of the Amendment 17A BPA indicates red snapper were also taken primarily with hook and line gear (93%) during 2005-2008 before the harvest prohibition. Black sea bass are predominantly taken with pots.

Table 1. Mean percentage of commercial landings by gear (2010-2011).

Species	Diving	Hook&Line	Longline	Pot	Other
Gag	25.49%	74.47%	0.02%	0.04%	0.00%
Black sea bass	0.08%	12.58%	0.03%	87.21%	0.11%
Vermilion snapper	0.00%	99.97%	0.00%	0.04%	0.00%
Red grouper	2.86%	97.08%	0.01%	0.07%	0.00%
Scamp	11.97%	88.03%	0.01%	0.00%	0.00%
Greater amberjack	6.44%	93.34%	0.21%	0.00%	0.02%
Gray triggerfish	1.70%	93.79%	2.52%	1.56%	0.44%

Source: NOAA's National Marine Fisheries Service (NMFS) Southeast Fisheries Science Center (SEFSC) commercial logbook (April 2012).

During 2010 and 2011, black sea bass were most abundantly captured by the recreational sector, and gray triggerfish landings were evenly divided between the commercial and recreational sectors (Table 2). The commercial sector dominated landings of other species, which commonly occur with red snapper. **Appendix R** from Amendment 17A indicates the recreational sector took approximately 83% of the red snapper landings during 2005-2008.

Table 2. Mean commercial and recreational landings (pounds whole weight) during 2010-2011. Commercial landings include all of Monroe County, Florida; MRFSS landings do not include Monroe County, Florida; Headboat landings include Monroe County, Florida for Atlantic-based vessels.

Species	Headboat	MRFSS	Recreational	Commercial	Percent Recreational	Percent Commercial
Gag	31,241	168,256	199,497	425,328	32%	68%
Black sea bass	260,900	503,973	764,873	400,080	66%	34%
Vermilion snapper	160,467	92,584	253,050	929,001	21%	79%
Red grouper	9,836	97,420	107,256	254,231	30%	70%
Scamp	21,300	34,960	56,261	183,007	24%	76%
Greater amberjack	55,429	609,787	665,216	947,443	41%	59%
Gray triggerfish	139,080	336,044	475,124	423,208	53%	47%

Source: SEFSC commercial annual catch limit (ACL) data (July 2012);
Recreational ACL data (July 2012).

Commercial Sector

During 2010 and 2011, approximately 20% of snapper grouper permitted vessels from the Gulf of Mexico and South Atlantic were randomly selected to fill out supplementary logbooks. The average number of trips per year during 2010 and 2011 was 21,318; and fishermen spent an average of 1.66 days at sea per trip (Table 3).

Table 3. Snapper grouper commercial fishery effort for South Atlantic.

Year	Trips	Days	Days per Trip
2010	13,387	22,347	1.67
2011	12,253	20,289	1.66
Mean	12,820	21,318	1.66

Source: NMFS SEFSC logbook program.

Among red snapper and co-occurring species during 2010-2011, the average percentage of trips that reported discards was greatest for vermilion snapper and red snapper (25% and 24%, respectively), followed by black sea bass (20%), scamp (13%), and gag (12%) (Table 4). Species with the greatest number of individuals discarded during 2010-2011 were vermilion snapper (44,155), red snapper (41,106), and black sea bass (32,548) (Table 4).

Since the discard logbook database represents a sample, data were expanded to estimate the number of discarded fish (Table 4). The formula used for expansion was: "discard per unit effort from discard logbook database * total effort from commercial logbook." Release mortality estimates for the commercial sector compiled from the most recent stock assessments (as available) using SEFSC's SEDAR process are: 48% red snapper (SEDAR 24; 2010b); 40% gag (SEDAR 10; 2006b); 1% black sea bass (SEDAR 25; 2011); 38% vermilion snapper (SEDAR 17; 2008b); 20% red grouper and 20% black grouper (SEDAR 19; 2010a); 20% greater amberjack (SEDAR 15; 2008a); and 0% gray triggerfish (Gulf of Mexico SEDAR 9; 2006a) (Table 4). Dead discards were estimated by applying the release mortality rates to the total discards. Discard mortality was highest for red snapper (19,731), followed by vermilion snapper (16,779) (Table 4). See the "Finfish Bycatch Mortality" and "Practicability of Management Measures in Directed Fisheries Relative to their Impact on Bycatch and Bycatch Mortality" sections of this BPA for more details.

Table 4. Percentage of commercial trips that discarded species and expanded commercial discards of red snapper and co-occurring species from 2010-2011.

Species	Percentage of trips that discarded species	Total discards	Release Mortality	Dead discards
Red snapper	24.17%	41,106	48%	19,731*
Gag	12.35%	7,913	40%	3,165
Black sea bass	20.43%	32,548	1%	325
Vermilion snapper	24.99%	44,155	38%	16,779
Red grouper	7.47%	2,447	20%	489
Scamp	13.10%	1,416	Unknown	Unknown
Greater Amberjack	6.11%	3,164	20%	633
Gray triggerfish	7.66%	1,845	0%	0

Note: Computed using mean discard rates (2010-2011) from commercial discard logbook applied to overall commercial effort reported to commercial logbook. ***Appendix B** of NMFS 2012 (SEFSC Report, May 2012).

Recreational Sector

For the recreational sector, estimates of the number of recreational discards are available from Marine Recreational Fisheries Statistical Survey (MRFSS) and the NMFS headboat survey. The MRFSS system classifies recreational catch into three categories:

- Type A - Fishes that were caught, landed whole, and available for identification and enumeration by the interviewers.
- Type B - Fishes that were caught but were either not kept or not available for identification:
    - Type B1 - Fishes that were caught and filleted, released dead, given away, or disposed of in some way other than Types A or B2.
    - Type B2 - Fishes that were caught and released alive.

Recreational harvest of red snapper co-occurring species was greatest for black sea bass followed by vermilion snapper, gray triggerfish, and gag (Table 5). There were differences in the amount and variety of species harvested by the private recreational sector and the “for-hire” sectors (charterboats/headboats). During 2010 and 2011, 90% of black sea bass, 89% of red grouper, and 84% of gag were discarded by the private recreational sector (Table 5). During the same period, 87% of red grouper and 67% of black sea bass were released by fishermen on charterboats, versus 88% of red grouper, 83% of black grouper, and 68% of black sea bass by fishermen on headboats (Table 5).

Release mortality estimates for the recreational sector compiled from the most recent stock assessments using data from SEDAR stock assessments (as available) are: 25% gag (SEDAR 10; 2006b); 7% black sea bass (SEDAR 25; 2011); 38% vermilion snapper (SEDAR 17; 2008b); 20% red grouper and 20% black grouper (SEDAR 19; 2010a); 20% greater amberjack (SEDAR 15; 2008a); and 0% gray triggerfish (Gulf of Mexico SEDAR 9; 2006a) (Table 5). Dead discards were estimated by applying the release mortality rates to the total discards. In 2010 and 2011, discard mortality was highest for black sea bass (207,156), vermilion snapper (19,425), and gag (19,136) for the private recreational sector (Table 5). For the "for-hire" sector (charterboats/headboats), discard mortality was highest for black sea bass (13,051/35,426), followed by vermilion snapper (6,464/35,228) and red grouper (1,381/2,099) (Table 5). Discard mortality was zero for gray triggerfish in 2010 and 2011, for both the private recreational and "for-hire" sectors (Table 5).

The SEFSC's May 2012 report (**Appendix B** of NMFS 2012) shows red snapper discard mortalities in the private recreational sector decreasing from 31,561 fish in 2010, to 16,156 fish in 2011. Conversely, the same report reveals red snapper discard mortalities in the "for-hire" sector (charterboats/headboats) increasing from 20,569 fish in 2010, to 22,131 fish in 2011. Release mortality rates for these two sectors are similar, 41% for the "for-hire" sector, and 39% for the private recreational sector (SEDAR 24; 2010b).

Table 5. Mean number (expanded) of MRFSS private, and charterboat and headboat recreational harvests (A+B1) and discards (B2) for the South Atlantic from 2010-2011.

	Private						Charterboat						Headboat					
Species	Total	A+B1	B2	Percent B2	Release Mortality	Dead Discards	Total	A+B1	B2	Percent B2	Release Mortality	Dead Discards	Total	A+B1	B2	% B2	Release Mortality	Dead Discards
Gag	90,715	14,170	76,545	84%	25%	19,136	3,064	1,795	1,269	41%	25%	317	7,295	2,957	4,339	59%	25%	1,085
Black sea bass	3,292,457	333,083	2,959,374	90%	7%	207,156	279,515	93,069	186,446	67%	7%	13,051	744,708	238,625	506,084	68%	7%	35,426
Vermilion snapper	98,756	47,637	51,119	52%	38%	19,425	45,621	28,610	17,012	37%	38%	6,464	228,610	135,904	92,707	41%	38%	35,228
Red grouper	62,765	6,963	55,802	89%	20%	11,160	7,900	996	6,904	87%	20%	1,381	11,914	1,421	10,493	88%	20%	2,099
Black grouper	5,765	2,209	3,556	62%	20%	711	451	253	198	44%	20%	40	1,841	315	1,527	83%	20%	305
Scamp	5,912	2,533	3,379	57%	25%	845	2,774	1,922	852	31%	25%	213	4,963	2,642	2,321	47%	25%	580
Greater amberjack	38,215	18,152	20,063	53%	20%	4,013	14,100	11,366	2,734	19%	20%	547	4,403	2,821	1,582	36%	20%	316
Gray triggerfish	180,375	99,995	80,380	45%	0%	0	44,982	39,513	5,469	12%	0%	0	76,475	61,082	15,393	20%	0%	0

Source: SEFSC Recreational ACL Dataset (July2012), Headboat CRNF files (expanded; July 2012).
Note: The use of MRFSS data has been recommended until ACLs are recomputed using recalibrated MRFSS>MRIP data.

Finfish Bycatch Mortality

SEDAR 24 (2010b) estimated acute release mortality rates of red snapper to be 48% for the commercial sector, 41% for recreational for-hire sector (charterboats and headboats), and 39% for the private recreational sector, in the South Atlantic. This stock assessment revised the release mortality estimate of 90% for the commercial sector as reported in SEDAR 15 (2008a). There was no significant difference between the two stock assessments regarding the release mortality of red snapper in the recreational sector, which was 40%, as per the findings in SEDAR 15 (2008a). Diamond and Campbell (2009) reported a delayed mortality rate of 64% off Texas. A study by Burns et al. (2004) conducted on headboats off Florida in the Atlantic and Gulf of Mexico found a release mortality of 64% for red snapper. The majority of acute mortalities in this study (capture depth of 9-42 m) were attributed to hooking (49%), whereas barotrauma accounted for 13.5%. An earlier study by Burns et al. (2002), also conducted in the Atlantic and Gulf of Mexico, had similar results, as J-hook mortality accounted for 56% of the acute mortalities of red snapper on headboats. Using tagging data and cage studies, Burns et al. (2002) determined the depth at which 50% of the released red snapper would die is 43.7 m (143 feet). SEDAR 15 (2008a) indicated red snapper were most often caught at depths of 141-190 feet by the recreational sector and 141-234 feet by the commercial sector. Rummer and Bennett (2005) reported over 70 different overexpansion injuries related to barotrauma in red snapper, and Wilde (2009) observed reduced survival of this species when vented.

SEDAR 17 (2008b) recommended a release mortality rate for vermilion snapper of 38% for both the commercial and recreational sectors. This was based on a mortality study conducted by Ruderhshausen et al. (2007) who estimated release mortality rates of 15% for undersized vermilion snapper. Immediate mortality of vermilion snapper was estimated to be 10% at depths of 25-50 m and delayed mortality was estimated to be 45% at the same depths. Rudershausen et al. (2007) indicated minimum size limits are moderately effective in shallower water for vermilion snapper. Previously, SEDAR 2 (2003) estimated a release mortality rate of 40% and 25% for vermilion snapper taken by commercial and recreational fishermen, respectively. Release mortality rates for vermilion snapper from SEDAR 2 (2003) were based on cage studies conducted by Collins (1996) and Collins et al. (1999). Burns et al. (2002) suggested that release mortality rates of vermilion snapper could be higher than those estimated from cage studies because cages protect the fish from predators. A higher release mortality rate is supported by low recapture rates of vermilion snapper in tagging studies. Burns et al. (2002) estimated a 0.7% recapture rate for 825 tagged vermilion snapper; whereas, recapture rates for red grouper, gag, and red snapper ranged from 3.8% to 6.0% (Burns et al. 2002). McGovern and Meister (1999) estimated a 1.6% recapture rate for 3,827 tagged vermilion snapper. Alternatively, recapture rates could be low if population size was very high or tagged fish were unavailable to fishing gear. Harris and Stephen (2005) indicated approximately 50% of released vermilion snapper caught by one commercial fisherman were unable to return to the bottom. Lower recapture rates were estimated for black sea bass (10.2%), gray triggerfish (4.9%), gag (11%), and greater amberjack (15.1%) (McGovern and Meister 1999; McGovern et al. 2005). Burns et al. (2002) suggested released vermilion snapper did not survive as well as other species due to predation. Vermilion snapper that do not have air removed from swim bladders are subjected to predation at the surface of the water. Individuals with a ruptured swim bladder or those that have air removed from the swim bladder are subject to bottom predators, since fish would not be able to

join schools of other vermilion snapper hovering above the bottom (Burns et al. 2002). However, Wilde (2009) reports that venting appears to be increasingly harmful for fish captured from deep water.

SEDAR 10 (2006b) estimated release mortality rates of 40% and 25% for gag taken by commercial and recreational fishermen, respectively. A tagging study conducted by McGovern et al. (2005) indicated recapture rates of gag decreased with increasing depth. The decline in recapture rate was attributed to depth-related mortality. Assuming there was no depth-related mortality at 0 m, McGovern et al. (2005) estimated depth related mortality ranged from 14% at 11-20 m (36-65 feet) to 85% at 71-80 m (233-262 feet). Similar trends in depth related mortality were provided by a gag tagging study conducted by Burns et al. (2002). Overton et al. (2008) reported post-release mortality for gag as 13.3%. Release mortality rates are not known for other shallow water grouper species, but could be similar to gag since they have a similar depth distribution. Rudershausen et al. (2007) estimated release mortality rates of 33% for undersized gag taken with J-hooks in depths of 25-50 m off North Carolina. For other gag caught at depths of 25-50 m, no immediate mortality was observed but delayed mortality was estimated to be 49%. McGovern et al. (2005) estimated a release mortality rate of 50% at 50 m, which is similar to the findings of Rudershausen et al. (2007). Rudershausen et al. (2007) concluded minimum size limits are effective for gag in the shallower portions of their depth range.

Release mortality rates were estimated as 20% for black grouper and red grouper taken by recreational fishermen in SEDAR 19 (2010a) during the data workshop. Wilson and Burns (1996) reported potential mortality rates for released red grouper to be low (0 - 14%) as long as the fish were caught from waters shallower than 44 m. SEDAR 15 (2008a) estimated a 20% release mortality rate for greater amberjack. In the Gulf of Mexico, SEDAR 9 (2006a) assumed a 0% release mortality rate for gray triggerfish.

Release mortality of black sea bass is considered to be low (7% for the recreational sector and 1% for the commercial sector) (SEDAR 25; 2011) indicating minimum size limits are probably an effective management tool for black sea bass. McGovern and Meister (1999) report a recapture rate of 10.2% for 10,462 that were tagged during 1993-1998 suggesting that survival of released black sea bass is high. Rudershausen et al. (2007) reported a sub-legal discard rate of 12% for black sea bass. Collins et al. (1999) reported venting of the swim bladder yielded reductions in release mortality of black sea bass, and the benefits of venting increased with capture depth. The same study was analyzed by Wilde (2009) to suggest that venting increased the survival of black sea bass, although this was an exception to the general findings of Wilde's (2009) study.

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

The snapper grouper fishery represents many species occupying the same location at the same time. For example, the top co-occurring species with red snapper are vermilion snapper, gag, scamp, greater amberjack, gray triggerfish, black sea bass, and red grouper. Fishermen could harvest one of these species and return a co-occurring species to the water as "regulatory discards" (e.g., if the fish is under the size limit) or if undesirable. A portion of the population would not survive. Species with the greatest number of individuals discarded by the commercial sector during 2010-2011 were vermilion snapper (44,155), red snapper (41,106), and black sea bass (32,548) (Table 4). During 2010-2011, 90% of black sea bass, 89% of red grouper, and 84% of gag were discarded by the private recreational sector (Table 5). During the same period, 87% of red grouper and 67% of black sea bass were released by fishermen on charterboats, versus 88% of red grouper, and 68% of black sea bass by fishermen on headboats (Table 5).

Although fishery management actions can adversely impact non-target species, the proposed action is not anticipated to significantly increase bycatch of snapper-grouper species. The red snapper ACL implemented in 2012 was relatively small (13,067 fish) and it is anticipated that potential increases over the short-term would also be small, and the seasons would be relatively short, none of the proposed actions are expected to substantially increase overall fishing effort or the spatial and/or temporal distribution of current fishing effort. Rather, the proposed action is likely to allow fishermen to retain incidentally caught red snapper when targeting co-occurring species. A portion of these red snapper might otherwise die when returned to the water.

Alternative 1 (no action) would retain the red snapper 20-inch total length (TL) minimum size limit; however, the size limit is currently not in effect due to prohibition on the harvest and possession of red snapper. Under **Alternative 1 (No Action),** if the season were to reopen, the minimum size limit would be effective. **Alternative 5 (Preferred)** would eliminate the size limit. Both alternatives could have adverse effects on the stock by promoting the discarding of fish to the water of which a portion would not survive. Release mortality rates for red snapper range from 39 to 48% depending on the fishing sector (SEDAR 24; 2010b). With a minimum size limit (**Alternative 1 (No Action))**, fishermen may produce "regulatory discards"; these are fish that are returned to the water because they are below the minimum size limit. These fish may be smaller and younger than a 20-inch TL fish and may have been caught in relatively shallow water. Often, discard mortality rates decrease along with depth that the fish was caught.

Adverse effects (additional mortality) could be produced 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. 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 biological effect than retaining the minimum size limit (**Alternative 1 (No Action**)) if it resulted in decreased bycatch.

Alternative 7 (Preferred) would establish a one per person per day bag limit. Currently, the harvest and possession of red snapper is prohibited (besides the limited 2012 season) and there is no 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, dead red snapper back. 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. However, the bag limit may reduce discards of red snapper and co-occurring species by discouraging the targeting of red snapper after the bag limited is reached.

Overall, elimination of the minimum size limit **(Preferred Alternative 5)** and establishment of a one fish bag limit **(Preferred Alternative 7)** could reduce the magnitude of bycatch even if high-grading occurs and have an overall positive biological effect on the stock.

Amendment 14 to the Snapper Grouper FMP (Amendment 14; SAFMC 2009a) established eight marine protected areas (MPAs) from North Carolina to Florida where harvest of snapper grouper species is prohibited. One of the objectives of Amendment 14 was to protect some areas where spawning of snapper grouper species (e.g., snowy grouper, golden tilefish, speckled hind, red porgy, vermilion snapper, gray triggerfish, red snapper, scamp, gag, red grouper, gray triggerfish, and others) was known to occur. As all harvest of snapper grouper species is prohibited in the MPAs, no bycatch of snapper grouper species in occurring in these areas.

Seasonal closures of shallow water grouper species (commercial and recreational sectors) and vermilion snapper (recreational sector) implemented through Amendment 16 to the Snapper Grouper FMP (Amendment 16; SAFMC 2009b) has likely reduced bycatch mortality of red snapper. Expected harvest reductions for red snapper from Amendment 16 in total kill was estimated to be 16.5% (commercial sector), 1.1 to 7.7% (headboat sector), and 2.3% (private/charter sector) (SERO 2009a; SERO 2009b; SERO 2009c; SERO 2009d). A longer spawning seasonal closure could enhance the reproductive potential of grouper stocks. For example, Amendment 16 established a January-April spawning season closure for gag, red grouper, black grouper, and shallow water grouper species. Gag are in spawning condition from December through April each year. There is some evidence spawning aggregations may be in place before and after a spawning season (Gilmore and Jones 1992). When aggregated, gag are extremely susceptible to fishing pressure since the locations are often well known by fishermen. Gilmore and Jones (1992) showed that the largest and oldest gag in aggregations are the most aggressive and first to be removed by fishing gear. Since gag change sex, larger and older males can be selectively removed. As a result, a situation could occur where there are not enough males in an aggregation to spawn with the remaining females. Furthermore, the largest, most fecund females could also be selectively removed by fishing gear. Therefore, a spawning season closure for all shallow water grouper species is expected to protect grouper species when they are most vulnerable to capture, reduce bycatch of co-occurring grouper species, increase the percentage of males in grouper populations, enhance reproductive success, and increase the magnitude of recruitment. Other actions in Amendment 16 that could reduce bycatch of snapper

grouper species include a reduction in the recreational bag limit to 1 gag or black grouper (combined) per day within a grouper aggregate bag limit of 3 fish and the establishment of a commercial quota for gag. When the commercial quota is met, all fishing for or possession of shallow water grouper species will be prohibited.

Unobserved mortality due to predation or trauma associated with capture could be substantial (Burns et al. 2002; Rummer and Bennett 2005; St. John and Syers 2005; Parker et al. 2006; Rudershausen et al. 2007; Hannah et al. 2008; Diamond and Campbell 2009). Amendment 16 also included actions that required the use of dehooking devices, which could help reduce bycatch mortality of vermilion snapper, black sea bass, gag, red grouper, black grouper, and red snapper. Dehooking devices can allow fishermen to remove hooks with greater ease and more quickly from snapper grouper species without removing the fish from the water. If a fish does need to be removed from the water, dehookers could still reduce handling time in removing hooks, thus increasing survival (Cooke et al. 2001).

In addition to prohibiting the harvest of red snapper, Amendment 17A implemented regulations requiring the use of non-stainless circle hooks north of 28 degrees N. latitude, effective March 2, 2011**.** Circle hooks are generally thought to reduce the discard mortality rate for red snapper (SEDAR 7 2005; Rummer 2007); however, Burns et al. (2004) did not observe decreased discard mortality rate when comparing recapture rates of red snapper caught on circle and J-hooks. Rummer (2007), and Diamond and Campbell (2009) found that a greater differential between the surface and bottom temperature caused a higher discard mortality rate for red snapper. Amendment 17B to the Snapper Grouper FMP (Amendment 17B; SAFMC 2010b) established ACLs and accountability measures (AMs) and addressed overfishing for eight species in the snapper grouper management complex listed at that time as undergoing overfishing: snowy grouper; speckled hind; warsaw grouper; black sea bass; gag; and red grouper; in addition to black grouper, golden tilefish, and vermilion snapper.

The Comprehensive ACL Amendment (SAFMC 2011a) implemented ACLs and accountability measures (AMs) for species not undergoing overfishing in four fishery management plans, in addition to other actions such as allocations and establishing annual catch targets for the recreational sector. The Comprehensive ACL Amendment also established additional measures to reduce bycatch in the snapper grouper fishery with the establishment of species complexes based on biological, geographic, economic, taxonomic, technical, social, and ecological factors. ACLs were assigned to these species complexes, and when the ACL for the complex is met or projected to be met, fishing for species included in the entire species complex is prohibited for the fishing year. ACLs and AMs will likely reduce bycatch of target species and species complexes as well as incidentally caught species (i.e., red snapper).

Amendment 18A to the Snapper Grouper FMP (Amendment 18A; SAFMC 2011b) contains measures to limit participation and effort for black sea bass, and does not directly affect red snapper. 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, modify the rebuilding strategy, and other necessary changes to management of black sea bass as a result of a 2011 stock assessment (SEDAR 25). Amendment 24 to the Snapper Grouper FMP

(Amendment 24; SAFMC 2011c) established a rebuilding plan for red grouper which is overfished and undergoing overfishing. Amendment 24 also established ACLs and AMs for red grouper that could help to reduce bycatch of red grouper and co-occurring species such as red snapper.

1.2 Ecological Effects Due to Changes in the Bycatch

The ecological effects of bycatch mortality are the same as fishing mortality from directed fishing efforts. If not properly managed and accounted for, either form of mortality could potentially reduce stock biomass to an unsustainable level.

Overall fishing effort could increase in the commercial and recreational sectors in response to the limited reopening(s) of red snapper, and therefore, increase the potential for bycatch. However, as stated in **Chapter 2** and analyzed in detail in **Chapter 4**, the reopening(s) would be of short duration (see **Chapter 6** for details), and therefore, the ecological effects due to changes in the bycatch would likely be small (see **Appendix C** (SERO 2012)) for detailed analysis.

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

The action in Amendment 28 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Amendment 28) for red snapper could allow a limited harvest of red snapper in 2013, and subsequent years. Thus, ecological changes could occur in the community structure of reef ecosystems through the proposed action, due to increased fishing pressure on co-occurring species that could be caught as bycatch. These ecological changes could affect the nature and magnitude of bycatch over time. However, as stated in **Chapters 2** and **4**, the allowed harvest of red snapper beginning in 2013 would likely be relatively limited in scope, and changes in the bycatch of other fish species and resulting population and ecosystem effects could be minimal in nature.

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 ABC is from rebuilding projections contained in Table 1-1 of Amendment 28. NMFS would calculate the total ACL as per the formula implemented thorough this amendment and the sector-ACLs as per the 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 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.

1.4 Effects on Marine Mammals and Birds

Under Section 118 of the Marine Mammal Protection Act (MMPA), NMFS must publish, at least annually, a List of Fisheries (LOF) that places all U.S. commercial fisheries into one of three categories based on the level of incidental serious injury and mortality of marine mammals that occurs in each fishery. Of the gear utilized within the snapper-grouper fishery, only the black sea bass pot is considered to pose an entanglement risk to marine mammals. The southeast U.S. Atlantic black sea bass pot fishery is included in the grouping of the Atlantic mixed species trap/pot fisheries, which the 2012 LOF classifies as a Category II (76 FR 73912; November 26, 2011). Gear types used in these fisheries are determined to have occasional incidental mortality and serious injury of marine mammals. For the South Atlantic snapper grouper fishery, the best available data on protected species interactions are from the SEFSC Supplementary Discard Data Program (SDDP) initiated in July of 2001. The SDDP sub-samples 20% of the vessels with an active permit. Since August 2001, only three interactions with marine mammals have been documented; each was taken by handline gear and each released alive (McCarthy SEFSC database). The longline and hook-and-line gear components of the snapper grouper fishery in the South Atlantic are classified in the 2012 LOF (76 FR 73912; November 26, 2011) as Category III fisheries.

Although the black sea bass pot fishery can pose an entanglement risk to large whales due to their distribution and occurrence, sperm, fin, sei, and blue whales are unlikely to overlap with the black sea bass pot fishery operated within the snapper grouper fishery since it is executed primarily off North Carolina and South Carolina (with some effort off Florida) in waters ranging from 70-120 feet deep (21.3-36.6 meters). There are no known interactions between the black sea bass pot fishery and large whales. NMFS' biological opinion on the continued operation of the South Atlantic snapper grouper fishery determined the possible adverse effects resulting from the fishery are extremely unlikely.

North Atlantic right and humpback whales may overlap both spatially and temporally with the black sea bass pot fishery. Revisions to the Atlantic Large Whale Take Reduction Plan folded the Atlantic mixed species trap/pot fisheries into the plan (72 FR 57104; October 5, 2007). The new requirements will help further reduce the likelihood of North Atlantic right and humpback whale entanglement in black sea bass pot gear.

The Bermuda petrel and roseate tern occur within the action area. Bermuda petrels are occasionally seen in the waters of the Gulf Stream off the coasts of North and South Carolina during the summer. Sightings are considered rare and only occurring in low numbers (Alsop 2001). Roseate terns occur widely along the Atlantic coast during the summer but in the southeast region, they are found mainly off the Florida Keys (unpublished U.S. Fish and Wildlife

Service data). Interaction with fisheries has not been reported as a concern for either of these species.

Fishing effort reductions have the potential to reduce the amount of interactions between the fishery and marine mammals and birds. Although, the Bermuda petrel and roseate tern occur within the action area, these species are not commonly found and neither has been described as associating with vessels or having had interactions with the snapper grouper fishery. Thus, it is believed that the snapper grouper fishery is not likely to negatively affect the Bermuda petrel and the roseate tern.

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

With the exception of a limited opening in 2012, harvest of red snapper has been prohibited since January 4, 2010 for both the commercial and recreational sectors. The action in Amendment 28 may allow a limited harvest of red snapper beginning in 2013. Since red snapper is a desirable species, it is highly likely that all opportunities to harvest this species would be entertained. Therefore, there could be changes to costs associated with the fishing, processing, disposal, and marketing of red snapper. It is likely that all four states (North Carolina, South Carolina, Georgia, and Florida) would be affected by the regulations associated with this action, since fishermen from all the states would be interested in participating in any reopening of the harvest of red snapper. Additionally, factors such as waterfront property values, availability of less expensive imports, etc. may affect economic decisions made by recreational and commercial fishermen.

The South Atlantic Council has discussed options to enhance current data collection programs in future amendments. This might provide more insight in calculating the changes in fishing, processing, disposal, and marketing costs. The states and the SEFSC would work together to collect as much biological information as possible during the limited commercial and recreational openings for red snapper. The life history information obtained through data collection efforts may help in assessing the status of the stock in 2014.

1.6 Changes in Fishing Practices and Behavior of Fishermen

Allowing harvest of red snapper could result in a modification of fishing practices by commercial and recreational fishermen, thereby affecting the magnitude of discards. However, as the increase in the red snapper ACL as proposed by Amendment 28 is likely to be very small and the seasons would be relatively short, none of the proposed actions are expected to substantially increase overall fishing effort or the spatial and/or temporal distribution of current fishing effort. With the exception of a limited opening in 2012, harvest of red snapper has been prohibited since January 4, 2010 for both the commercial and recreational sectors. Since red snapper is a desirable species, it is highly likely that all opportunities to harvest this species would be entertained. Predicting changes in angler behavior in response to a reopening is difficult. Many factors can influence fishing activity (see **Chapter 3** for more details) including:

fuel costs and trip expenses; weather; changes in regulations; changes in fishing behavior; and conflicting activities (e.g., family activities, sporting events on weekends).

Poor weather, along with closures of co-occurring species, likely constrained the commercial and recreational harvest of red snapper in 2012, making it difficult to determine how fishermen will respond to a similar opening in 2013. Following the 7 day commercial opening of red snapper in September 2012, commercial harvest was reopened for 8 days in November 2012 and 7 days in December 2012. Total landings were well below the ACL. Recreational landings will not be available for the recreational sector until March 2013.

If harvest is allowed, NMFS would announce the pre-determined commercial and recreational fishing year start dates. 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.

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

Research and monitoring is ongoing to understand the effectiveness of proposed management measure and their effect on bycatch. Efforts are underway by the states and the SEFSC to enhance data collection activities if a limited opening for red snapper were to occur. In 1990, the SEFSC initiated a logbook program for vessels with federal permits in the snapper grouper fishery from the Gulf of Mexico and South Atlantic. Approximately 20% of commercial fishermen are asked to fill out discard information in logbooks; however, a greater percentage of fishermen could be selected with emphasis on individuals that dominate landings. Recreational discards are obtained from the Marine Recreational Information Program (MRIP) and logbooks from the NMFS headboat program.

Additional data collection activities for the recreational sector are being considered by the South Atlantic Council that could allow for a better monitoring of snapper grouper bycatch in the future. The SEFSC is developing electronic logbooks, which could be used to enable fishery managers to obtain information on species composition, size distribution, geographic range, disposition, and depth of fishes that are released. Some observer information has been provided by Marine Fisheries Initiative and Cooperative Research Programs, but more is desired for the snapper grouper fishery. Electronic logbook reporting is in place for headboats in the southeast, which is expected to improve the quality of data in that sector. Further, the South Atlantic Council is developing an amendment that could require vessel monitoring systems for snapper grouper vessels, which would be expected to improve data quality.

Cooperative research projects between science and industry are being used to a limited extent to collect bycatch information on the snapper grouper fishery in the South Atlantic. For example, Harris and Stephen (2005) characterized the entire (retained and discarded) catch of

reef fishes from a selected commercial fisherman in the South Atlantic including total catch composition and disposition of fishes that were released. The Gulf and South Atlantic Fisheries Foundation, Inc. conducted a fishery observer program within the snapper grouper vertical hook-and-line (bandit rig) fishery of the South Atlantic United States. Through contractors they randomly placed observers on cooperating vessels to collect a variety of data quantifying the participation, gear, effort, catch, and discards within the fishery.

In the spring 2010, Archipelago Marine Research Ltd. worked with North Carolina Sea Grant and several South Atlantic Unlimited Snapper Grouper Permit holders to test the effectiveness of electronic video monitoring to measure catch and bycatch. A total of 93 trips were monitored with video monitoring, 34 by self-reported fishing logbooks, and 5 by observers. Comparisons between electronic video monitoring data and observer data showed that video monitoring was a reliable source of catch and bycatch data.

Research funds for observer programs, as well as gear testing and testing of electronic devices are also available each year in the form of grants from the Foundation, Marine Fisheries Initiative, Saltonstall-Kennedy program, and the CRP. Efforts are made to emphasize the need for observer and logbook data in requests for proposals issued by granting agencies. A condition of funding for these projects is that data are made available to the Councils and NMFS upon completion of a study.

Additional administrative and enforcement efforts would help to implement and enforce fishery regulations. The South Atlantic Council is considering requiring VMS on all commercial snapper grouper vessels that would greatly improve enforcement. NMFS established the South East Fishery-Independent Survey in 2010 to strengthen fishery-independent sampling efforts in southeast US waters, addressing both immediate and long-term fishery-independent data needs, with an overarching goal of improving fishery-independent data utility for stock assessments. Meeting these data needs is critical to improving scientific advice to the management process, ensuring overfishing does not occur, and successfully rebuilding overfished stocks on schedule.

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

Preferred alternatives, including those that are likely to increase or decrease discards could result in social and/or economic impacts as discussed in **Chapter 4** of the EA.

1.9 Changes in the Distribution of Benefits and Costs

The ACL for the commercial and recreational sectors that will result from the equation proposed in Amendment 28 would be based on allocations established in the Comprehensive ACL Amendment. Management measures proposed in Amendment 28 such as the elimination of the minimum size limit and reduction in the bag limit have the potential to reduce bycatch of red snapper during a limited opening of the recreational and commercial sectors. See earlier

section titled, “Practicability of Management Measures in Directed Fisheries Relative to their Impact on Bycatch and Bycatch Mortality”, in this BPA for a list of amendments and a summary of actions within them that could help reduce bycatch and discard mortality in the snapper grouper fishery. The extent to which these management measures would increase or decrease the magnitudes of discards is unknown. However, this depends on the degree to which fishermen shift effort to other species, seasons, or fisheries and whether effort decreases in response to more restrictive management measures as well as changes in community structure and age/size structures that could result from ending overfishing.

1.10 Social Effects

The social effects of all the alternatives, including those most likely to reduce bycatch, are described in **Chapter 4** of the EA.

1.11 Conclusion

This section evaluates the practicability of taking additional action to minimize bycatch and bycatch mortality in the South Atlantic snapper grouper fishery using the ten factors provided at 50 CFR 600.350(d)(3)(i). In summary, management measures proposed in Amendment 28 such as the elimination of the minimum size limit and reduction in the bag limit have the potential to reduce bycatch of red snapper during a limited opening of the recreational and commercial sectors. Seasonal closures for snapper grouper species in Amendment 16, MPAs implemented through Amendment 14, as well as the total prohibition for red snapper in Amendment 17A may contribute to decreases in bycatch of red snapper and co-occurring species. The requirement of dehooking devices, a recreational/commercial seasonal closure for gag, reduction of recreational bag limits, and closing all shallow water groupers when a gag quota is met or during a gag seasonal closure specified in Amendment 16 could also help to reduce bycatch. However, this depends on the degree to which fishermen shift effort to other species, seasons, or fisheries and whether effort decreases in response to more restrictive management measures as well as changes in community structure and age/size structures that could result from ending overfishing. Furthermore, overall fishing effort could decrease in the commercial and recreational sectors in response to more restrictive management measures, thereby reducing the potential for bycatch.

ACLs and AMs established by Amendment 17B and the Comprehensive ACL Amendment could help reduce bycatch by limiting the amount of harvest and provide for accountability if the ACL is exceeded. Management measures in Amendment 17B limit harvest of co-occurring species (vermilion snapper, gag, scamp, greater amberjack, gray triggerfish, black sea bass, and red grouper) and could help reduce discard mortality of red snapper.

Amendment 18A contains measures to limit participation and effort for black sea bass, which co-occurs with red snapper. In addition, Amendment 18A includes measures to reduce bycatch in the black sea bass pot fishery, modify the rebuilding strategy, and other necessary changes to

management of black sea bass as a result of a 2011 stock assessment (SEDAR 25). Amendment 24 specifies ACLs and AMs for red grouper, which could reduce bycatch of red grouper co-occurring species such as red snapper.

The South Atlantic Council is considering actions in future amendments such as a tag program in Amendment 22 to the Snapper Grouper FMP (Amendment 22) to allow harvest of red snapper as the stock rebuilds. Scoping of Amendment 22 was conducted during January and February 2011. Additionally, a new regulatory amendment is under development to allow for adjustment of allocations and ACLs based on the new landings information from MRIP. Finally, at their June 2012 meeting, the South Atlantic Council requested development of a regulatory amendment to adjust management measures for greater amberjack, vermilion snapper, black sea bass, gray triggerfish, and vermilion snapper, which co-occur with red snapper.

REFERENCES:

Alsop, III, F. J. 2001. Smithsonian Handbooks: Birds of North America eastern region. DK Publishing, Inc. New York, NY.

Burns, K.M., C.C. Koenig, and F.C. Coleman. 2002. Evaluation of multiple factors involved in release mortality of undersized red grouper, gag, red snapper, and vermilion snapper. Mote Marine Laboratory Technical Report No. 790.

Burns, K.M., N.F. Parnell, and R.R. Wilson. 2004. Partitioning release mortality in the undersized red snapper bycatch: comparison of depth versus hooking effects. Mote Marine Laboratory Technical Report No. 932.

Collins, M.R. 1996. Survival estimates for demersal reef fishes released by anglers. Proc. Gulf Caribb. Fish. Inst. 44:259-269.

Collins, M.R., J.C. McGovern, G. R. Sedberry, H.S. Meister, and R. Pardieck. 1999. Swim bladder deflation in black sea bass and vermilion snapper: potential for increasing post-release survival. North American. Journal of Fisheries Management. 19:828-832.

Cooke, S.J., D.P. Philipp, K.M. Dunmall, and J.F. Schreer. 2001. The influence of terminal tackle on injury, handling time, and cardiac disturbance of rock bass. North American Journal of Fisheries Management. Vol. 21, no. 2, pp. 333-342.

Gilmore, R.G. and R.S. Jones. 1992. Color variation and associated behavior in the epinepheline groupers, *Mycteroperca microlepis* (Goode and Bean) and *M. phenax* (Jordan and Swain). Bulletin of Marine Science 51: 83-103.

Diamond, S.L. and M.D. Campbell. 2009. Linking "sink or swim" indicators to delayed mortality in red snapper by using a condition index. Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science. 1:107-120.

Hannah, R.W., S.J. Parker, and K.M. Matteson. 2008. Escaping the surface: the effect of capture depth on submergence success of surface-released Pacific rockfish. North American Journal of Fisheries Management. 28: 694-700.

Harris, P.J. and J. Stephen. 2005. Final Report Characterization of commercial reef fish catch and bycatch off the southeast coast of the United States. CRP Grant No. NA03NMF4540416.

McGovern, J.C. and H.M. Meister. 1999. Data Report on MARMAP Tagging Activities From the Southeast Coast of the United States. MARMAP Data Report.

McGovern, J.C., G.R. Sedberry, H.S. Meister, T.M. Westendorff, D.M. Wyanski, and P.J. Harris. 2005. A Tag and Recapture Study of Gag, *Mycteroperca microlepis*, from the Southeastern United States. Bull. Mar. Sci. 76:47-59.

NMFS (National Marine Fisheries Service). 2010. Interim Rule for Red Snapper. Federal Register, September 24, 2010 (Volume 75, Number 185).

NMFS (National Marine Fisheries Service). 2012. "Measures to Allow Limited Harvest of Red Snapper (*Lutjanus campechanus*) in the South Atlantic in 2012 (Temporary Measures through Emergency Action)" NMFS Southeast Regional Office. 83 pp. plus appendices.

Overton, A.S., J. Zabawski, and K.L. Riley. 2008. Release mortality of undersized fish from the snapper-grouper complex off the North Carolina coast. North American Journal of Fisheries Management. 28: 733-739.

Parker, S.J., H.I. McElderry, P.S. Rankin, and R.W. Hannah. 2006. Buoyancy regulation and barotrauma in two species of nearshore rockfish. Transactions of the American Fisheries Society. 135: 1213-1223.

Rudershausen, P.J., J.A. Buckel, and E.H. Williams. 2007. Discard composition and release fate in the snapper and grouper commercial hook-and-line fishery in North Carolina, USA, Fish. Man. Ecol. 14:103–113.

Rummer, J.L. and W.A. Bennett. 2005. Physiological effects of swim bladder overexpansion and catastrophic decompression on red snapper. Transactions of the American Fisheries Society. 134(6): 1457-1470.

Rummer, J.L. 2007. Factors affecting catch and release (CAR) mortality in fish: Insight into CAR mortality in red snapper and the influence of catastrophic decompression. American Fisheries Society. 60:123-144.

SAFMC (South Atlantic Fishery Management Council). 2009a. Amendment 14 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Impact Statement, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 608 pp. plus appendices.

SAFMC (South Atlantic Fishery Management Council). 2009b. Amendment 16 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Impact Statement, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 608 pp. plus appendices.

SAFMC (South Atlantic Fishery Management Council). 2010a. Amendment 17A to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Impact Statement, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 385 pp. with appendices.

SAFMC (South Atlantic Fishery Management Council). 2010b. Amendment 17B to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 406 pp. plus appendices.

SAFMC (South Atlantic Fishery Management Council). 2011a. Comprehensive Annual Catch Limit Amendment for the South Atlantic Region with Final Environmental Impact Statement, Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 755 pp. plus appendices.

SAFMC (South Atlantic Fishery Management Council). 2011b. Amendment 18A to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Impact Statement, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 292 pp. plus appendices.

SAFMC (South Atlantic Fishery Management Council). 2011c. Amendment 24 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Final Environmental Assessment, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, 4055 Faber Place Drive, Ste 201, Charleston, S.C. 29405. 256 pp. plus appendices.

SEDAR 2. 2003. Stock Assessment Report 2. Report of stock assessment: South Atlantic Vermilion snapper. Available from the SEDAR website: www.sefsc.noaa.gov/sedar/

SEDAR 7. 2005. Stock Assessment Report 1 (Gulf of Mexico Red Snapper). Available from the SEDAR website: www.sefsc.noaa.gov/sedar/

SEDAR 9. 2006a. Stock Assessment Report 1 (Gulf of Mexico Gray Triggerfish). Available from the SEDAR website: www.sefsc.noaa.gov/sedar/

SEDAR 10. 2006b. Stock assessment of gag in the South Atlantic. Available from the SEDAR website: www.sefsc.noaa.gov/sedar/

SEDAR 15. 2008a. Stock Assessment Report 1 (revised March, 2009). South Atlantic Red Snapper. Available from the SEDAR website: www.sefsc.noaa.gov/sedar/

SEDAR 17. 2008b. Stock Assessment Report. South Atlantic Vermilion Snapper. Available from the SEDAR website: www.sefsc.noaa.gov/sedar/

SEDAR 19. 2010a. Stock Assessment Report 1 (South Atlantic and Gulf of Mexico Black Grouper); and Stock Assessment Report 2 (South Atlantic Red Grouper). Available from the SEDAR website: www.sefsc.noaa.gov/sedar/

SEDAR 24. 2010b. Stock Assessment Report. South Atlantic Red Snapper. Available from the SEDAR website: www.sefsc.noaa.gov/sedar/

SEDAR 25. 2011. Stock Assessment Report. South Atlantic Red Snapper. Available from the SEDAR website: www.sefsc.noaa.gov/sedar/

SEFSC Report. May 2012. South Atlantic Red Snapper: Estimated mortalities in 2010 and 2011. 6p.

SERO. 2009a. Evaluating the Effects of Amendment 13C, Amendment 16, and Amendment 17A Regulations on Red Snapper Removals by South Atlantic Commercial Fisheries. SERO-LAPP-2009-03, NMFS, SERO, St. Petersburg, FL. 41 pp.

SERO. 2009b. Evaluating the Effects of Amendment 16 Regulations on 2005-2007 South Atlantic Red Snapper Headboat Removals. SERO-LAPP-2009-04, NMFS, SERO, St. Petersburg, FL. 10 pp.

SERO. 2009c. Evaluating the Effects of Amendment 16 Regulations on 2005-2007 South Atlantic Red Snapper Private and Charterboat Removals. SERO-LAPP-2009-05, NMFS, SERO, St. Petersburg, FL.

SERO. 2009d. Evaluating the Effects of Amendment 17A Regulations on 2005-2007 South Atlantic Red Snapper Headboat Removals. SERO-LAPP-2009-06, NMFS, SERO, St. Petersburg, FL. 13 pp.

SERO. 2012. South Atlantic Red Snapper Reopening. NOAA Fisheries Service, Southeast Regional Office, St. Petersburg, FL. 15 pp.

St. John, J. and C.J. Syers. 2005. Mortality of the demersal West Australian dhufish, (Richardson 1845) following catch and release: the influence of capture depth, venting and hook type. Fisheries Research. 76: 106-116.

Wilde, G.R. 2009. Does venting promote survival of released fish? Fisheries Management. 34(1): 20-28.

Wilson, R.R. and K.M. Burns. 1996. Potential survival of released groupers caught deeper than 40 m based on shipboard and in-situ observations, and tag-recapture data. Bulletin of Marine Science. 58(1): 234-247.

APPENDIX C

1.0 REGULATORY IMPACT REVIEW

1.1 Introduction

The National Marine Fisheries Service requires a Regulatory Impact Review (RIR) for all regulatory actions that are of public interest. The RIR does three things: 1) provides a comprehensive review of the level and incidence of impacts associated with a proposed or final regulatory action; 2) provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives that could be used to solve the problem; and 3) ensures that the regulatory agency systematically and comprehensively considers all available alternatives so that the public welfare can be enhanced in the most efficient and cost-effective way. The RIR also serves as the basis for determining whether the proposed regulations are a "significant regulatory action" under the criteria provided in Executive Order (E.O.) 12866 and provides some information that may be used in conducting an analysis of impacts on small business entities pursuant to the Regulatory Flexibility Act (RFA). This RIR analyzes the impacts that the proposed management alternatives in this rule would be expected to have on the red snapper component of the South Atlantic snapper grouper fishery.

1.2 Problems and Objectives

The problems and objectives addressed by this action are discussed in Section 1.4 of this document and are incorporated herein by reference. In summary, the objectives of this action are to allow a limited harvest for red snapper to occur in 2013 and in the future, thereby increasing the social and economic benefits to fishermen and fishing communities that utilize the red snapper component of the snapper grouper fishery, while also minimizing safety at sea concerns, the probability of annual catch limit (ACL) overages, and discard mortality of red snapper. In addition, establishing a fishing season should allow an opportunity to collect information on the life history of red snapper.

1.3 Description of Fisheries

A description of the South Atlantic snapper grouper fishery and the red snapper component thereof is provided in Chapter 3 of this document and is incorporated herein by reference.

1.4 Impacts of Management Measures

1.4.1 Action 1: Changes to Red Snapper Management Measures, Including the Establishment of a Process to Determine Future Annual Catch Limits and Fishing Seasons, and Accountability Measures

A detailed analysis of the economic effects expected to result from this action is provided in **Section 4.1.3** and is incorporated herein by reference. Notwithstanding the establishment of a fishing season in 2012 as described below, **Alternative 1 (No Action)** would maintain a red snapper ACL of zero, and thus red snapper could not be harvested or possessed in or from the South Atlantic exclusive economic zone (EEZ). Further, because red snapper could not be harvested or possessed in or from the South Atlantic EEZ, the 20-inch total length minimum size limit and inclusion of red snapper in the 10 fish snapper combined bag limit would not be in effect. The accountability measures for red snapper would be as follows: 1) track red snapper catch per unit effort (CPUE) 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; and 4) during the closed seasons, the recreational and commercial ACLs are zero (landings only).

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. 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 trip limit was 50 lbs gw and there was no minimum size limit for red snapper. 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 season length and 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 season length and bag limit.

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 total mortality (landings and discards) was 53,101 and 40,237 fish in 2010 and 2011, respectively. Assuming 2011 is more reflective than 2010 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 (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 is likely zero.

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-alternative 2c (Preferred)** would compare ratios to the present-year acceptable biological catch (ABC) to determine the level of removals that would be allowed. The ratio is the level of "left over removals" in the previous two years relative to the ABC in the previous two years. Thus, the ACL in each year is dependent on the ABC and total removals estimates.

Because **Sub-alternative 2c (Preferred)** 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, reliable 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. Similarly, reliable quantitative estimates of the expected changes in CS and net operating revenues (NOR) under those alternatives cannot be generated at this time. As a result, the expected relative changes in gross revenue for the commercial sector, CS for the private recreational and for-hire sectors, and NOR for the for-hire sector are evaluated relative to **Alternative 1 (No Action)** on a qualitative basis in general**.**

Because the no action alternative (**Alternative 1**) prohibits the harvest, possession, and sale of red snapper, and **Sub-alternative 2c (Preferred)** would generate a positive probability that the ACL would be sufficiently large to allow for a commercial and recreational season, the economic effects of **Sub-alternative 2c (Preferred)** are generally expected to be positive. That is, there is a positive probability that gross revenue for the commercial sector and, to a lesser extent, NOR to the for-hire sector would be greater than zero, and CS for the private recreational and for-hire sectors under **Sub-alternative 2c (Preferred)** would be greater than $337,186 (the CS value under **Alternative 1 (No Action)**). The probability that NOR in the for-hire sector would be greater than zero is less than the probability that gross revenue in the commercial sector would be greater than zero because the recreational ACL would have to be sufficiently high to induce targeting of red snapper, the likelihood of which is relatively small in the short-term as ACLs are expected to be relatively small.

However, this conclusion must be cautioned because, based on the quantitative estimates in the example found in **Table 4.1**, **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 red snapper to re-open. Thus, the long-term economic effects of **Sub-alternative 2c (Preferred)** may also be positive relative to **Alternative 1 (No Action)**, but this is highly uncertain as new information (e.g., updated stock assessment) would potentially affect the ACLs and season lengths resulting from the methodology under **Sub-alternative 2c (Preferred)**.

Alternative 3 establishes the starting date of the commercial season. Specifically, the commercial season would start on the second Monday in July under **Sub-alternative 3a (Preferred)**. In order for **Sub-alternative 3a (Preferred)** to generate any economic effects, it must be presumed that **Sub-alternative 2c (Preferred)** results in an open commercial season. Otherwise, choice of a season start date is irrelevant. Although the direct economic effects will result from **Sub-alternative 2c (Preferred)**, it is possible that selection of a specific season start date may enhance or reduce those direct economic effects and thereby generate indirect economic effects. However, 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).

Given the relatively small ACL expected under **Sub-alternative 2c (Preferred)** and the relatively small trip limit under **Sub-alternative 6c (Preferred)**, it is expected that red snapper would be harvested incidentally on trips targeting other species 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. Vermilion snapper is the primary target species on trips that commercially harvest red snapper. If vermilion snapper is closed, then it is highly likely vermilion snapper 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 can be commercially harvested than when it cannot. As vermilion snapper was not closed to commercial harvest until September of 2009 and 2011, respectively, and October 2010, it is likely to be open in July of 2013 and beyond. Thus, the economic benefits from allowing commercial harvest of red snapper under **Sub-alternative 2c (Preferred)** may be slightly enhanced if the red snapper season is opened in July, as is the case under **Sub-alternative 3a (Preferred)**.

Alternative 4 establishes the start date of the recreational season. Specifically, the recreational season would start on the second Friday in July under **Sub-alternative 4a (Preferred)**. In order for **Sub-alternative 4a (Preferred)** to generate any economic effects, it must be presumed that **Sub-alternative 2c (Preferred)** results in an open recreational season. Otherwise, choice of a season start date is irrelevant. Although the direct economic effects will result from **Sub-alternative 2c (Preferred)**, it is possible that selection of a specific season start date may enhance or reduce those direct economic effects and thereby generate indirect economic effects. However, 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.

Available data indicates that catch, catch effort, and target effort are relatively high in July and August (wave 4). 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 **Sub-alternative 4a (Preferred)** would be expected to enhance the economic benefits to the recreational sector resulting from **Sub-alternative 2c (Preferred)** relative to **Alternative 1 (No Action)**.

Alternative 5 (Preferred) eliminates the commercial and recreational minimum size limit for red snapper during the respective commercial and recreational fishing seasons. In order for **Alternative 5 (Preferred)** to generate any economic effects, it must be presumed that **Sub-alternative 2c (Preferred)** results in an open season. Otherwise, the size limit is irrelevant.

At least in the short-run, given the relatively small ACLs expected under **Sub-alternative 2c (Preferred)**, the relatively small commercial trip limit under **Sub-alternative 6c (Preferred)**, and the relatively low level of abundance at present, it is unlikely that red snapper will be commercially targeted. Assuming red snapper are only or at least predominantly 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 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 indirect economic effects of **Alternative 5 (Preferred)** are expected to be positive (i.e., reduction in trip costs) relative to **Alternative 1 (No Action)** 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 are dependent on the trip limit chosen under **Alternative 6**. In general, the larger the trip limit, the greater the economic benefits from elimination of the size limit. Since **Sub-alternative 6c (Preferred)** would implement a 75 lb gw trip limit, the economic benefits from elimination of the size limit are not as large as they could have been.

Alternative 5 (Preferred) allows 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 are expected to 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**).

Alternative 6 establishes a commercial trip limit. The trip limit is 75 lbs gw under **Sub-alternative 6c (Preferred)**. In order for **Sub-alternative 6c (Preferred)** to generate any economic effects, it must be presumed that **Sub-alternative 2c (Preferred)** results in an open commercial season. Otherwise, the commercial trip limit is irrelevant.

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 is determined by **Sub-alternative 2c (Preferred)**. 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. Conversely, **Sub-alternative 2c (Preferred)** creates some probability that the ACL will be sufficiently large to have a commercial fishing season.

The function of a trip limit is to spread out the available commercial 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 under **Sub-alternative 2c (Preferred)**, 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 relatively high, the trip limit under **Sub-alternative 6c (Preferred)** and abundance would also 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 entirely harvested incidentally on trips targeting other species 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.

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 attempt 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, it would be economically desirable to harvest the available quota with the lowest level of effort.

In general, **Sub-alternative 6c (Preferred)** would require more trips be taken to harvest the available quota and associated gross revenue relative to having no trip limit. Thus, net revenue in the commercial sector in the short-term is expected to be less under **Sub-alternative 6c (Preferred)** relative to having no trip limit, but still greater than under **Alternative 1 (No Action)** since no harvest would occur and net revenue would be zero.

In addition, **Sub-alternative 6c (Preferred)** would help 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. Such regulations would be expected to reduce gross and net revenue. In this respect, the long-term economic effects of **Sub-alternative 6c (Preferred)** are likely positive.

Alternative 7 (Preferred) establishes a recreational bag limit of 1 fish per person per day. In order for **Alternative 7 (Preferred)** to generate any economic effects, it must be presumed that **Sub-alternative 2c (Preferred)** results in an open recreational season. Otherwise, the bag limit is irrelevant.

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 highgrading, 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 on the same trip. The more fish that 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 ACL resulting from **Sub-alternative 2c (Preferred)** and whether targeting of red snapper would increase, as the latter would potentially affect red snapper catch per trip. The anticipated ACLs resulting from **Sub-alternative 2c (Preferred)** are expected to be relatively small and thus an increase in targeting is not expected.

In general, the greater the recreational ACL, the greater would be the economic benefits of **Alternative 7 (Preferred)**. 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, the ABC increases, and the recreational ACL is positive, noting again that the resulting ACL under the formula may change in the long-term due to new information (e.g., updated stock assessment).

Alternative 7 (Preferred) 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 **Alternative 7 (Preferred** would likely be positive for this reason as well.

1.5 Public and Private Costs of Regulations

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

South Atlantic Fishery Management Council (Council) costs of document preparation, meetings, public hearings, and information dissemination……..$35,000

NMFS administrative costs of document preparation, meetings, and review…….....$20,000

TOTAL…….....$55,000

The Council and Federal costs of document preparation are based on staff time, travel, printing, and any other relevant items where funds were expended directly for this specific action.

1.6 Determination of Significant Regulatory Action

Pursuant to E.O. 12866, a regulation is considered a "significant regulatory action" if it is likely to result in: 1) An annual effect of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities; 2) create a serious inconsistency or otherwise interfere with an action taken or planned by another agency; 3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights or obligations of recipients thereof; or 4) raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this executive order. Based on the information provided above, this action has been determined to not be economically significant for purposes of E.O. 12866.

APPENDIX D

1.0 REGULATORY FLEXIBILITY ACT ANALYSIS

1.1 Introduction

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

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

In addition to the information provided in this section, additional information on the expected economic impacts of the proposed action is included in Chapter 4 and Appendix C.

1.2 Statement of the need for, objectives of, and legal basis for the rule

A discussion of the reasons why action by the agency is being considered is provided in Section 1.4 of this document. In summary, the purpose of this proposed rule is to allow a limited harvest of red snapper to occur in 2013 and in the future. The objectives of this proposed rule are to increase the social and economic benefits to fishermen and fishing communities that utilize the red snapper component of the snapper grouper fishery while also minimizing safety at sea

concerns, the probability of annual catch limit (ACL) overages, and discard mortality of red snapper. In addition, establishing a fishing season should allow an opportunity to collect information on the life history of red snapper. The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) serves as the legal basis for the proposed rule.

1.3 Description and estimate of the number of small entities to which the proposed action would apply

This proposed rule is expected to directly affect commercial fishing vessels that possess commercial snapper grouper permits and for-hire vessels that possess for-hire snapper grouper permits for the South Atlantic. The Small Business Administration has established size criteria for all major industry sectors in the U.S. including fish harvesters. A business involved in fish harvesting is classified as a small business if it is independently owned and operated, is not dominant in its field of operation (including its affiliates), and has combined annual receipts not in excess of $4.0 million (NAICS code 114111, finfish fishing) for all its affiliated operations worldwide. For for-hire vessels, the other qualifiers apply and the receipts threshold is $7.0 million (NAICS code 713990, recreational industries).

From 2003 through 2007, the number of commercial South Atlantic 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 pounds of harvest per trip. The comparable numbers for 2008-2010 were 788 total permits, of which 643 were transferable permits and 145 transferable permits. As of July 9, 2012, there were 694 vessels with commercial snapper grouper permits, of which 568 were transferable and 126 were non-transferable.

Any commercial vessel with a commercial snapper grouper permit may commercially harvest red snapper in the South Atlantic. Red snapper is landed mostly in Georgia and northeast Florida and is caught mostly with vertical lines. On average, 220 vessels landed at least one pound of red snapper per year between 2003 and 2007. Of these 220 vessels, 102 landed less than 100 pounds of red snapper per year, 84 landed 101-1000 pounds, and only 34 landed more than 1,000 pounds. In addition, red snapper was not the primary revenue species on most trips that harvested red snapper during those years. 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 landings.

From 2005 through 2009, the average number of vessels harvesting at least one pound of red snapper per year increased to 230, and peaked at 270 vessels in 2009. This increase in participation was most likely caused in part by the impending closure of red snapper to commercial harvest in 2010 as well as the closure of vermilion snapper to commercial harvest in September 2009. Vermilion snapper is the primary target species on trips catching red snapper and a primary substitute species for red snapper in seafood markets.

From 2003 through 2007, landings of red snapper averaged approximately 121,000 pounds annually, with an average ex-vessel value of $488,030 (2011 dollars). Because commercial harvest and sale of red snapper was prohibited in 2010 and 2011, landings and gross revenue

from 2008 and 2009 are the most currently available. For these two years, red snapper landings averaged approximately 309,000 pounds valued at $1.01 million. During 2005-2009, commercial harvest of red snapper averaged approximately 171,000 pounds valued at approximately $709,441 per year. Thus, the average price of commercially harvested red snapper during this time was approximately $4.15 and average red snapper landings and gross revenue was approximately 743 pounds and $3,085 per vessel.

From 2003 through 2007, an average of 890 commercial vessels per year harvested snapper grouper species. For 2008 through 2011, an average of 865 commercial vessels harvested snapper grouper species per year. Average annual commercial landings of all snapper grouper species in the South Atlantic from 2003-2007 were approximately 6.43 million pounds with an ex-vessel value of approximately $14.98 million. The corresponding average figures for 2008 through 2011 are 5.03 million pounds valued at $13.66 million. All harvests by all vessels harvesting snapper grouper averaged approximately 11.24 million pounds valued at $24.74 million over 2003-2007. Comparable averages for 2008 through 2011 are 12.21 million pounds valued at $23.86 million, respectively. Thus, for 2008 through 2011, average annual gross revenue per vessel in the snapper grouper fishery was approximately $27,584. Red snapper accounted for none of these vessels' gross revenue in 2010 and 2011 due to the prohibition on commercial harvest and sale. In 2011, the maximum annual gross revenue for a commercial snapper grouper vessel was $618,272.

From 2003 through 2008, the average of number of snapper grouper for-hire permits in the South Atlantic was 1,811. In 2009-2010, the number of South Atlantic snapper grouper for-hire permits averaged 1,953. As of July 9, 2012, the number of for-hire vessels with South Atlantic for-hire snapper grouper permits was 1,524. Florida is the homeport state for most of these vessels. For-hire permits do not distinguish charterboats from headboats and thus the specific number of charterboats and headboats with for-hire snapper-grouper permits cannot be estimated. The number of for-hire vessels that landed snapper grouper during this time period also cannot be estimated based on currently available data.

Any for-hire vessel with a for-hire snapper grouper permit may harvest red snapper recreationally in the South Atlantic. From 2003 through 2008, recreational red snapper harvest in the South Atlantic averaged approximately 403,000 pounds annually. Charter and headboat vessels accounted for approximately 110,000 pounds and 62,000 pounds of this harvest, respectively. Although retention of recreationally harvested red snapper in the South Atlantic was prohibited in 2010 and 2011, some red snapper continued to be harvested by the recreational sector. From 2009 through 2011, recreational red snapper harvest averaged about 346,000 pounds although most of this harvest was in 2009. Charter vessels and headboat vessels accounted for approximately 75,000 pounds and 51,000 pounds of this harvest, respectively.

Recreational snapper grouper harvest in the South Atlantic averaged approximately 10.8 million pounds per year from 2005 through 2009. Charter vessels and headboat vessels accounted for approximately 1.6 million pounds and 1.4 million pounds of this harvest, respectively. In 2010 and 2011, recreational snapper grouper harvest averaged approximately 11.8 million pounds annually, with charter and headboat vessels each accounting for 1.2 million pounds of this harvest, respectively.

Red snapper target effort in the recreational sector averaged approximately 57,300 trips per year in the South Atlantic during 2005-2009. While the prohibition on retention of recreationally harvested red snapper 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 rather than release suggests that target effort would be expected to decline in response to the prohibition. In 2010, red snapper target effort significantly dropped to about 4,000 trips and became practically non-existent in 2011.

For-hire vessels 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 gross 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 snapper grouper or red snapper for-hire trips are not available. However, proxy values in the form of net operating revenue are available. Net operating revenue for charter vessels is estimated to be $132 (2011 dollars) per charter trip. Since targeting of red snapper in the recreational sector was practically non-existent in 2011, net operating revenue from trips targeting red snapper was likely zero in 2011 for charter vessels. Holland et al. (2012) reported that charter vessels in the South Atlantic had average gross revenues of approximately $106,000 per vessel in 2009, or approximately $109,700 in 2011 dollars. Holland et al. also reported that, in 2009, no charter vessels earned more than $500,000 in gross revenues.

Net operating revenue per angler trip is lower for headboats than for charterboats. Net operating revenue estimates for a representative headboat trip are $48 in the Gulf of Mexico, including all of Florida, and $63-$68 in North Carolina. For full-day and overnight headboat trips, net operating revenue is estimated to be $74-$77 in North Carolina. These estimates are in 2009 dollars and comparable estimates are not available for Georgia and South Carolina. Based on this information, net operating revenue per headboat angler trip is estimated to be $68 (2009 dollars), or approximately $70 in 2011 dollars. Since targeting of red snapper in the recreational sector was practically non-existent in 2011, net operating revenue from trips targeting red snapper was likely zero in 2011 for headboat vessels. Holland et al. (2012) reported that headboats in the South Atlantic had average revenues of approximately $188,000 per vessel in 2009, or approximately $194,570 in 2011 dollars.

Based on the figures above, all commercial fishing vessels expected to be directly affected by this proposed rule are determined for the purpose of this analysis to be small business entities. Similarly, based on these figures, all for-hire fishing vessels expected to be directly affected by this proposed rule are determined for the purpose of this analysis to be small business entities.

1.4 Description of the projected reporting, record-keeping and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirement and the type of professional skills necessary for the preparation of the report or records

This proposed action would not establish any new reporting, record-keeping, or other compliance requirements.

1.5 Identification of all relevant federal rules, which may duplicate, overlap or conflict with the proposed rule

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

1.6 Significance of economic impacts on small entities

Substantial number criterion

This proposed rule, if implemented, would be expected to directly affect all federally permitted commercial fishing entities and for-hire fishing entities in the South Atlantic snapper grouper fishery. All affected entities have been determined, for the purpose of this analysis, to be small entities. Therefore, it is determined that the proposed rule will affect a substantial number of small entities.

Significant economic impacts

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

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

All entities expected to be directly affected by the measures in this proposed rule are determined for the purpose of this analysis to be small business entities, so the issue of disproportionality does not arise in the present case.

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

For the action to establish a process to determine future ACLs and season lengths, a commercial fishing season start date of the second Monday in July, a recreational fishing season start date of second Friday in July, a commercial trip limit of 75 lbs gutted weight (gw), a recreational bag limit of one fish per person per day, and eliminate the minimum size limit for red snapper, the expected, direct economic effects cannot be estimated quantitatively. Since this action only establishes a methodological approach for estimating potential ACLs and the resulting season lengths in 2013 and future years, quantitative estimates of ACLs and season lengths for the commercial and recreational sectors are not currently available for 2013 and future years. Because the ACLs and season lengths for the commercial and recreational sectors are currently unknown, quantitative estimates of potential changes in landings and gross revenue for the commercial sector as well target trips and net operating revenue (NOR) for the for-hire sector in 2013 and future years cannot be provided at this time.

However, this action would generate a positive probability that the ACL would be sufficiently large to allow for a commercial and recreational season. Thus, the economic effects of this action are generally expected to be positive in the short-term. That is, there is a positive probability that gross revenue for the commercial sector and, to a lesser extent, NOR to the for-hire sector would be greater than zero. The probability that NOR in the for-hire sector would be greater than zero is less than the probability that gross revenue in the commercial sector would be greater than zero because the recreational ACL and the for-hire sector's share of the harvest would have to be sufficiently high to increase target effort for red snapper in the for-hire sector. The likelihood of this occurring is relatively small in the short-term as ACLs are expected to be relatively small and the for-hire sector has historically only accounted for 10% of the red snapper target effort in the recreational sector. Long-term direct economic effects are also expected to be positive, as the probability of a fishing season would still be positive, but are dependent on information arising from future stock assessments and the effect of such information on estimates of acceptable biological catch in future years.

If the commercial ACL is sufficiently large to allow a commercial fishing season, gross revenue from the commercial harvest of red snapper would be positive and thus so too would be the economic benefits. These benefits are expected to be slightly enhanced by the commercial season start date of the second Monday in July as red snapper are typically caught on trips targeting vermilion snapper and gag, which are likely to be open to commercial harvest at that time. Closure of vermilion snapper to commercial harvest would largely preclude commercial harvest of red snapper. Elimination of the minimum size limit would also be expected to slightly enhance those benefits as it would allow commercial vessels to harvest the ACL more quickly and thereby reduce costs and increase profits. Conversely, the 75 lb gw trip limit is expected to slightly reduce those benefits by spreading harvest over more trips and thereby increase costs and decrease profits.

Similarly, if the recreational ACL is sufficiently large to allow a recreational fishing season, net operating revenue (NOR) from trips targeting red snapper by for-hire vessels may be positive. However, relative to the commercial vessels, this outcome is much less likely for for-hire vessels as the recreational ACL and the for-hire sector's share of the harvest would have to be sufficiently great to induce targeting of red snapper and thereby increase target effort. Since the recreational ACL is expected to be relatively small in the short-term and the for-hire sector historically only accounted for 10% of red snapper target effort in the recreational sector, the increase in for-hire vessels' target effort is likely to be minimal at best in the short-term. NOR will only increase if target effort for red snapper increases. Because target effort for red snapper was historically high in July, the recreational fishing season start date of the second Friday in July may slightly enhance these economic benefits as red snapper are presumably more highly valued at this time of year. Similarly, a one-fish bag limit may also slightly enhance these benefits by spreading harvest over a larger number of trips, which would increase net operating revenue. Elimination of the minimum size limit may also slightly enhance these economic benefits by increasing the number of fish caught per trip or increasing trip length. Longer trips would generally be expected to increase NOR for for-hire vessels.

As a result of the information above, no reduction in profits for a substantial number of small entities would be expected.

1.7 Description of significant alternatives to the proposed action and discussion of how the alternatives attempt to minimize economic impacts on small entities

This proposed action, if implemented, would not be expected to have a significant direct adverse economic effect on the profits of a substantial number of small entities. As a result, the issue of significant alternatives is not relevant.

References

Holland, S. M., C. Oh, S.L. Larkin, and A.W. Hodges. 2012. The Operations and Economics of For-Hire Fishing Fleets of the South Atlantic States and the Atlantic Coast of Florida. Report prepared for the National Marine Fisheries Service. MARFIN Grant Number NA09NMF4330151.

Appendix E. Essential Fish Habitat and Move to Ecosystem Based Management

South Atlantic Fishery Management Council Habitat Conservation, Ecosystem Coordination and Collaboration

The Council, using the Essential Fish Habitat Plan as the cornerstone, adopted a strategy to facilitate the move to an ecosystem-based approach to fisheries management in the region. This approach required a greater understanding of the South Atlantic ecosystem and the complex relationships among humans, marine life and the environment including essential fish habitat. To accomplish this, a process was undertaken to facilitate the evolution of the Habitat Plan into a Fishery Ecosystem Plan (FEP), thereby providing more comprehensive understanding of the biological, social and economic impacts of management necessary to initiate the transition from single species management to ecosystem-based management in the region.

Moving to Ecosystem-Based Management

The Council adopted broad goals for Ecosystem-Based Management to include maintaining or improving ecosystem structure and function; maintain or improving economic, social and cultural benefits from resources; and maintaining or improving biological, economic and cultural diversity. Development of a regional FEP (SAFMC 2009a) provided an opportunity to expand scope of the original Council Habitat Plan and compile and review available habitat, biological, social, and economic fishery and resource information for fisheries in the South Atlantic ecosystem. The South Atlantic Council views habitat conservation at the core of the move to EBM in the region. Therefore, development of the FEP was a natural next step in the evolution and expands and significantly updates the SAFMC Habitat Plan (SAFMC 1998a) incorporating comprehensive details of all managed species (SAFMC, South Atlantic States, ASMFC, and NOAA Fisheries Highly Migratory Species and Protected Species) including their biology, food web dynamics, and economic and social characteristics of the fisheries and habitats essential to their survival. The FEP therefore serves as a source document presents more complete and detailed information describing the South Atlantic ecosystem and the impact of the fisheries on the environment. This FEP updates information on designated Essential Fish Habitat (EFH) and EFH-Habitat Areas of Particular Concern; expands descriptions of biology and status of managed species; presents information that will support ecosystem considerations for managed species; and describes the social and economic characteristics of the fisheries in the region. In addition, it expands the discussion and description of existing research programs and needs to identify biological, social, and economic research needed to fully address ecosystem-based management in the region. In is anticipated that the FEP will provide a greater degree of guidance by fishery, habitat, or major ecosystem consideration of bycatch reduction, prey-predator interactions, maintaining biodiversity, and spatial management needs. This FEP serves as a living source document of biological, economic, and social information for all Fishery Management Plans (FMP). Future Environmental Assessments and Environmental Impact Statements associated with subsequent amendments to Council FMPs will draw from or cite by reference the FEP.

The Fishery Ecosystem Plan for the South Atlantic Region encompasses the following volume structure:
FEP Volume I - Introduction and Overview of FEP for the South Atlantic Region
FEP Volume II - South Atlantic Habitats and Species
FEP Volume III - South Atlantic Human and Institutional Environment
FEP Volume IV - Threats to South Atlantic Ecosystem and Recommendations

FEP Volume V - South Atlantic Research Programs and Data Needs
FEP Volume VI - References and Appendices

Comprehensive Ecosystem-Based Amendment (CE-BA) 1 (SAFMC 2009b) is supported by this FEP and updates EFH and EFH-HAPC information and addresses the Final EFH Rule (e.g., GIS presented for all EFH and EFH-HAPCs). Management actions implemented in the CE-BA establish deepwater Coral HAPCs to protect what is thought to be the largest continuous distribution (>23,000 square miles) of pristine, deepwater coral ecosystems in the world.

Ecosystem Approach to Deepwater Ecosystem Management

The South Atlantic Council manages coral, coral reefs and live/hard bottom habitat, including deepwater corals, through the Fishery Management Plan for Coral, Coral Reefs and Live/Hard Bottom Habitat of the South Atlantic Region (Coral FMP). Mechanisms exist in the FMP, as amended, to further protect deepwater coral and live/hard bottom habitats. The SAFMC's Habitat and Environmental Protection Advisory Panel and Coral Advisory Panel have supported proactive efforts to identify and protect deepwater coral ecosystems in the South Atlantic region. Management actions in Comprehensive Ecosystem-Based Amendment (CE-BA 1) (SAFMC 2009b) established deepwater coral HAPCs (C-HAPCs) to protect what is thought to be the largest continuous distribution (>23,000 square miles) of pristine deepwater coral ecosystems in the world. In addition, CE-BA 1 established areas within the CHAPC, which provide for traditional fishing in limited areas, which do not impact deepwater coral habitat. CE-BA 1, supported by the FEP, also addresses non-regulatory updates for existing EFH and EFH- HAPC information and addresses the spatial requirements of the Final EFH Rule (i.e., GIS presented for all EFH and EFH-HAPCs).

Building from a Habitat to an Ecosystem Network to Support the Evolution

Starting with our Habitat and Environmental Protection Advisory Panel, the Council expanded and fostered a comprehensive Habitat network in our region to develop the Habitat Plan of the South Atlantic Region completed in 1998 to support the EFH rule. Building on the core regional collaborations, the Council facilitated an expansion to a Habitat and Ecosystem network to support the development of the FEP and CE-BA as well as coordinate with partners on other regional efforts.

These efforts include participation as a member and on the Board of the Southeast Coastal Regional Ocean Observing Association (SECOORA) to guide and direct priority needs for observation and modeling to support fisheries oceanography and integration into stock assessment process through SEDAR. Cooperation through SECOORA is envisioned to facilitate the following:

- Refining current or water column designations of EFH and EFH-HAPCs (e.g., Gulf Stream and Florida Current)
- Providing oceanographic models linking benthic, pelagic habitats and food webs
- Providing oceanographic input parameters for ecosystem models
- Integration of OOS information into Fish Stock Assessment process in the SA region
- Facilitating OOS system collection of fish and fishery data and other research necessary to support the Council's use of area-based management tools in the SA Region including but not limited to EFH, EFH-HAPCs, Marine Protected Areas, Deepwater Coral Habitat Areas of Particular Concern, Special Management Zones and Allowable Gear Areas.
- Integration of OOS program capabilities and research Needs into the South Atlantic Fishery Ecosystem Plan

- Collaboration with SECOORA to integrate OOS products on the Council's Habitat and Ecosystem Internet Mapping System to facilitate model and tool development
- Expanding IMS and Arc Services will provide permissioned researchers access to data or products including those collected/developed by SA OOS partners

In addition, the Council serves on the National Habitat Board and, as a member of the Southeast Aquatic Resource Partnership (SARP), has highlighted the collaboration by including the Southeast Aquatic Habitat Plan and associated watershed conservation restoration targets into the FEP. Many of the habitat, water quality, and water quantity conservation needs identified in the threats and recommendations Volume of the FEP are directly addressed by on-the-ground projects supported by SARP. This cooperation results in funding fish habitat restoration and conservation intended to increase the viability of fish populations and fishing opportunity, which also meets the needs to conserve and manage Essential Fish Habitat for Council managed species or habitat important to their prey.

Initially discussed as a South Atlantic Eco-regional Compact, the Council has also cooperated with South Atlantic States in the formation of a Governor's South Atlantic Alliance (SAA). This will also provide regional guidance and resources that will address State and Council broader habitat and ecosystem conservation goals. The SAA was initiated in 2006. An Executive Planning Team (EPT), by the end of 2007, had created a framework for the Governors South Atlantic Alliance. The formal agreement between the four states (NC, SC, GA, and FL) was executed in May 2009. The Agreement specifies that the Alliance will prepare a "Governors South Atlantic Alliance Action Plan" which will be reviewed annually for progress and updated every five years for relevance of content. Alliance mission and purpose is to promote collaboration among the four states, and with the support and interaction of federal agencies, academe, regional organizations, non-governmental organizations, and the private sector, to sustain and enhance the region's coastal and marine resources. The Alliance proposes to regionally implement science-based actions and policies that balance coastal and marine ecosystems capacities to support both human and natural systems. An Action Plan was approved by the Governors and an Implementation Plan is under development.

One of the more recent collaborations is the Council participation as Steering Committee member for the newly establish South Atlantic Landscape Conservation Cooperative (SALCC). Landscape Conservation Cooperatives (LCCs) are applied conservation science partnerships focused on a defined geographic area that informs on-the-ground strategic conservation efforts at landscape scales. LCC partners include DOI agencies, other federal agencies, states, tribes, non-governmental organizations, universities and others. The newly formed Department of Interior Southeast Climate Services Center (CSC) has the LCCs in the region as their primary clients. One of the initial charges of the CSCs is to downscale climate models for use at finer scales.

Building Tools to support EBM in the South Atlantic Region

The Council has developed a Habitat and Ecosystem Section of the website http://www.safmc.net/ecosystem/Home/EcosystemHome/tabid/435/Default.aspx and, in cooperation with the Florida Wildlife Research Institute (FWRI), developed a Habitat and Ecosystem Internet Map Server (IMS) http://www.safmc.net/EcosystemManagement/EcosystemBoundaries/MappingandGISData/tabid/62/Default.aspx. The IMS was developed to support Council and regional partners' efforts in the transition to EBM. Other regional partners include NMFS Habitat Conservation, South Atlantic States,

local management authorities, other Federal partners, universities, conservation organizations, and recreational and commercial fishermen. As technology and spatial information needs evolve, the distribution and use of GIS demands greater capabilities. The Council has continued its collaboration with FWRI in the now evolution to Web Services initially for Essential Fish Habitat (http://ocean.floridamarine.org/SAFMC_EFH/) and Fishery Regulations (http://ocean.floridamarine.org/SAFMC_Regulations/) and is refining permissioned services for Fishery Independent and Habitat Research and developing one for Ocean Energy activities in the region (e.g., wind, wave and current).

Ecosystem Based Action, Future Challenges and Needs

The Council has implemented ecosystem-based principles through several existing fishery management actions including establishment of deepwater Marine Protected Areas for the Snapper Grouper fishery, proactive harvest control rules on species (e.g., dolphin and wahoo) which are not overfished, implementing extensive gear area closures which in most cases eliminate the impact of fishing gear on Essential Fish Habitat and use of other spatial management including Special Management Zones. Pursuant to the development of the Comprehensive Ecosystem-Based Amendment, the Council is taking an ecosystem approach to protect deepwater ecosystems while providing for traditional fisheries for the Golden Crab and Royal Red shrimp in areas where they do not impact deepwater coral habitat. The stakeholder based process taps in on an extensive regional Habitat and Ecosystem network. Support tools facilitate Council deliberations and with the help of regional partners, are being refined to address long-term ecosystem management needs.

One of the greatest challenges to the long-term move to EBM in the region is funding high priority research, including but not limited to, comprehensive benthic mapping and ecosystem model and management tool development. In addition, collecting detailed information on fishing fleet dynamics including defining fishing operation areas by species, species complex and season, as well as catch relative to habitat is critical for assessment of fishery, community, and habitat impacts and for Council use of place based management measures. Additional resources need to be dedicated to expand regional coordination of modeling, mapping, characterization of species use of habitats, and full funding of regional fishery independent surveys (e.g., MARMAP, SEAMAP and SEFIS) which are linking directly to addressing high priority management needs. Development of ecosystem information systems to support Council management should build on existing tools (e.g., Regional Habitat and Ecosystem GIS and Arc Services) and provide resources to regional cooperating partners for expansion to address long-term Council needs.

The FEP and CE-BA 1 complement, but do not replace, existing FMPs. In addition, the FEP serves as source document to the CE-BAs. NOAA should support and build on regional coordination efforts of the Council as it transitions to a broader management approach. Resources need to be provided to collect information necessary to update and refine our FEP and support future fishery actions including but not limited to completing one of the highest priority needs to support EBM, the completion of mapping of near-shore, mid-shelf, shelf edge and deepwater habitats in the South Atlantic region. In developing future FEPs, the Council will draw on SAFEs (Stock Assessment and Fishery Evaluation reports) which NMFS is required to provide the Council for all FMPs implemented under the Magnuson-Stevens Act. The FEP, serving as the source document for CE-BAs, could also meet NMFS SAFE requirements if information is provided to the Council to update necessary sections.

EFH and EFH-HAPC Designations Translated to Cooperative Habitat Policy Development and Protection

The Council actively comments on non-fishing projects or policies that may impact fish habitat. Appendix A of the Comprehensive Amendment Addressing Essential Fish Habitat in Fishery Management Plans of the South Atlantic Region (SAFMC 1998b) outlines the Council's comment and policy development process and the establishment of a four-state Habitat Advisory Panel. Members of the Habitat Advisory Panel serve as the Council's habitat contacts and professionals in the field. AP members bring projects to the Council's attention, draft comment letters, and attend public meetings. With guidance from the Advisory Panel, the Council has developed and approved policies on:

1. Energy exploration, development, transportation and hydropower re-licensing;
2. Beach dredging and filling and large-scale coastal engineering;
3. Protection and enhancement of submerged aquatic vegetation;
4. Alterations to riverine, estuarine and nearshore flows; and
5. Marine aquaculture.
6. Marine Ecosystems and Non-Native and Invasive Species
7. Estuarine Ecosystems and Non-Native and Invasive Species

NOAA Fisheries, State and other Federal agencies apply EFH and EFH-HAPC designations and protection policies in the day-to-day permit review process. In addition to the workshop process described above the revision and updating of existing habitat policies and the development of new policies is being coordinated with core agency representatives on the Habitat and Coral Advisory Panels. Existing policies are included at the end of this Appendix.

South Atlantic Bight Ecopath Model

The Council worked cooperatively the University of British Columbia and the Sea Around Us project to develop a straw-man and preliminary food web models (Ecopath with Ecosim) to characterize the ecological relationships of South Atlantic species, including those managed by the Council. This effort was envisioned to help the Council and cooperators in identifying available information and data gaps while providing insight into ecosystem function. More importantly, the model development process provides a vehicle to identify research necessary to better define populations, fisheries and their interrelationships. While individual efforts are still underway in the South Atlantic (e.g., Biscayne Bay) only with significant investment of new resources through other programs will a comprehensive regional model be further developed.

Essential Fish Habitat and Essential Fish Habitat Areas of Particular Concern

Following is a summary of the current South Atlantic Council's EFH and EFH-HAPCs. Information supporting their designation is being updated (pursuant to the EFH Final Rule) in the Council's Fishery Ecosystem Plan and Comprehensive Ecosystem Amendment:

Snapper Grouper FMP

Essential fish habitat for snapper-grouper species 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 600 feet (but to at least 2000 feet for wreckfish) where the annual water temperature range is sufficiently warm to maintain adult populations of members of this largely tropical complex. EFH includes the spawning area in the water column above the adult habitat and the additional pelagic environment, including *Sargassum*, required for larval survival and growth up to and including

settlement. In addition the Gulf Stream is an essential fish habitat because it provides a mechanism to disperse snapper grouper larvae.

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

Areas which meet the criteria for 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; nearshore 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). In addition, the Council through CEBA 2 (SAFMC 2011) is proposing the deepwater snapper grouper MPAs and golden tilefish and blueline tilefish habitat as EFH-HAPCs under the Snapper Grouper FMP as follows:

EFH-HAPCs for golden tilefish to include irregular bottom comprised of troughs and terraces inter-mingled with sand, mud, or shell hash bottom. Mud-clay bottoms in depths of 150-300 meters are HAPC. Golden tilefish are generally found in 80-540 meters, but most commonly found in 200-meter depths.

EFH-HAPC for blueline tilefish to include irregular bottom habitats along the shelf edge in 45-65 meters depth; shelf break; or upper slope along the 100-fathom contour (150-225 meters); hardbottom habitats characterized as rock overhangs, rock outcrops, manganese-phosphorite rock slab formations, or rocky reefs in the South Atlantic Bight; and the Georgetown Hole (Charleston Lumps) off Georgetown, SC.

EFH-HAPCs for the snapper grouper complex to include the following deepwater Marine Protected Areas (MPAs) as designated in Snapper Grouper Amendment 14; Snowy Grouper Wreck MPA, Northern South Carolina MPA, Edisto MPA, Charleston Deep Artificial Reef MPA, Georgia MPA, North Florida MPA, St. Lucie Hump MPA and East Hump MPA.

Shrimp FMP

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

For rock shrimp, essential fish habitat consists of offshore terrigenous and biogenic sand bottom habitats

from 18 to 182 meters in depth with highest concentrations occurring between 34 and 55 meters. This applies for all areas from North Carolina through the Florida Keys. Essential fish habitat includes the shelf current systems near Cape Canaveral, Florida, which provide major transport mechanisms affecting planktonic larval rock shrimp. These currents keep larvae on the Florida Shelf and may transport them inshore in spring. In addition the Gulf Stream is an essential fish habitat because it provides a mechanism to disperse rock shrimp larvae.

Essential fish habitat for royal red shrimp include the upper regions of the continental slope from 180 meters (590 feet) to about 730 meters (2,395 feet), with concentrations found at depths of between 250 meters (820 feet) and 475 meters (1,558 feet) over blue/black mud, sand, muddy sand, or white calcareous mud. In addition the Gulf Stream is an essential fish habitat because it provides a mechanism to disperse royal red shrimp larvae.

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

Coastal Migratory Pelagics FMP

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

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

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

Golden Crab FMP

Essential fish habitat for golden crab includes the U.S. Continental Shelf from Chesapeake Bay south

through the Florida Straits (and into the Gulf of Mexico). In addition, the Gulf Stream is an essential fish habitat because it provides a mechanism to disperse golden crab larvae. The detailed description of seven essential fish habitat types (a flat foraminferan ooze habitat; distinct mounds, primarily of dead coral; ripple habitat; dunes; black pebble habitat; low outcrop; and soft-bioturbated habitat) for golden crab is provided in Wenner et al. (1987). There is insufficient knowledge of the biology of golden crabs to identify spawning and nursery areas and to identify HAPCs at this time. As information becomes available, the Council will evaluate such data and identify HAPCs as appropriate through the framework.

Spiny Lobster FMP

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

Areas which meet the criteria for EFH-HAPCs for spiny lobster include Florida Bay, Biscayne Bay, Card Sound, and coral/hard bottom habitat from Jupiter Inlet, Florida through the Dry Tortugas, Florida.

Coral, Coral Reefs, and Live/Hard Bottom Habitats FMP

Essential fish habitat for corals (stony corals, octocorals, and black corals) must incorporate habitat for over 200 species. EFH for corals include the following:

A. Essential fish habitat for hermatypic stony corals includes rough, hard, exposed, stable substrate from Palm Beach County south through the Florida reef tract in subtidal to 30 m depth, subtropical (15°-35° C), oligotrophic waters with high (30-35$^{o}/_{oo}$) salinity and turbidity levels sufficiently low enough to provide algal symbionts adequate sunlight penetration for photosynthesis. Ahermatypic stony corals are not light restricted and their essential fish habitat includes defined hard substrate in subtidal to outer shelf depths throughout the management area.

B. Essential fish habitat for *Antipatharia* (black corals) includes rough, hard, exposed, stable substrate, offshore in high (30-35$^{o}/_{oo}$) salinity waters in depths exceeding 18 meters (54 feet), not restricted by light penetration on the outer shelf throughout the management area.

C. Essential fish habitat for octocorals excepting the order Pennatulacea (sea pens and sea pansies) includes rough, hard, exposed, stable substrate in subtidal to outer shelf depths within a wide range of salinity and light penetration throughout the management area.

D. Essential fish habitat for Pennatulacea (sea pens and sea pansies) includes muddy, silty bottoms in subtidal to outer shelf depths within a wide range of salinity and light penetration.

Areas which meet the criteria for EFH-HAPCs for coral, coral reefs, and live/hard bottom include: The 10-Fathom Ledge, Big Rock, and The Point (North Carolina); Hurl Rocks and The Charleston Bump (South Carolina); Gray's Reef National Marine Sanctuary (Georgia); The *Phragmatopoma* (worm reefs) reefs off the central east coast of Florida; Oculina Banks off the east coast of Florida from Ft. Pierce to Cape Canaveral; nearshore (0-4 meters; 0-12 feet) hard bottom off the east coast

of Florida from Cape Canaveral to Broward County); offshore (5-30 meter; 15-90 feet) hard bottom off the east coast of Florida from Palm Beach County to Fowey Rocks; Biscayne Bay, Florida; Biscayne National Park, Florida; and the Florida Keys National Marine Sanctuary. In addition, the Council through CEBA 2 (SAFMC 2011) is proposing the Deepwater Coral HAPCs as EFH-HAPCs under the Coral FMP as follows:

Deepwater Coral HAPCs designated in Comprehensive Ecosystem-Based Amendment 1 as Snapper Grouper EFH-HAPCs: Cape Lookout Coral HAPC, Cape Fear Coral HAPC, Blake Ridge Diapir Coral HAPC, Stetson-Miami Terrace Coral HAPC, Pourtalés Terrace Coral HAPC.

Dolphin and Wahoo FMP

EFH for dolphin and wahoo is the Gulf Stream, Charleston Gyre, Florida Current, and pelagic *Sargassum*. This EFH definition for dolphin was approved by the Secretary of Commerce on June 3, 1999 as a part of the South Atlantic Council's Comprehensive Habitat Amendment (SAFMC, 1998b) (dolphin was included within the Coastal Migratory Pelagics FMP).

Areas which meet the criteria for EFH-HAPCs for dolphin and wahoo in the Atlantic include The Point, The Ten-Fathom Ledge, and Big Rock (North Carolina); The Charleston Bump and The Georgetown Hole (South Carolina); The Point off Jupiter Inlet (Florida); The Hump off Islamorada, Florida; The Marathon Hump off Marathon, Florida; The "Wall" off of the Florida Keys; and Pelagic *Sargassum*. This EFH-HAPC definition for dolphin was approved by the Secretary of Commerce on June 3, 1999 as a part of the South Atlantic Council's Comprehensive Habitat Amendment (dolphin was included within the Coastal Migratory Pelagics FMP).

Pelagic *Sargassum* Habitat FMP

The Council through CEBA 2 (SAFMC 2011) is proposing to designate the top 10 meters of the water column in the South Atlantic EEZ bounded by the Gulfstream, as EFH for pelagic Sargassum.

Actions Implemented That Protect EFH and EFH-HAPCs

Snapper Grouper FMP

- Prohibited the use of the following gears to protect habitat: bottom longlines in the EEZ inside of 50 fathoms or anywhere south of St. Lucie Inlet Florida, fish traps, bottom tending (roller- rig) trawls on live bottom habitat, and entanglement gear.
- Established the *Oculina* Experimental Closed Area where the harvest or possession of all species in the snapper grouper complex is prohibited.

Shrimp FMP

- Prohibition of rock shrimp trawling in a designated area around the *Oculina* Bank,
- Mandatory use of bycatch reduction devices in the penaeid shrimp fishery,
- Mandatory Vessel Monitoring System (VMS) in the Rock Shrimp Fishery.
- A mechanism that provides for the concurrent closure of the EEZ to penaeid shrimping if environmental conditions in state waters are such that the overwintering spawning stock is severely depleted.

Pelagic Sargassum Habitat FMP

- Prohibited all harvest and possession of *Sargassum* from the South Atlantic EEZ south of the latitude line representing the North Carolina/South Carolina border (34° North Latitude).
- Prohibited all harvest of *Sargassum* from the South Atlantic EEZ within 100 miles of shore between the 34° North Latitude line and the Latitude line representing the North Carolina/Virginia border.
- Harvest of *Sargassum* from the South Atlantic EEZ is limited to the months of November through June.
- Established an annual Total Allowable Catch (TAC) of 5,000 pounds landed wet weight.
- Required that an official observer be present on each *Sargassum* harvesting trip. Require that nets used to harvest *Sargassum* be constructed of four inch stretch mesh or larger fitted to a frame no larger than 4 feet by 6 feet.

Coastal Migratory Pelagics FMP

- Prohibited of the use of drift gillnets in the coastal migratory pelagic fishery;

Golden Crab FMP

- In the northern zone golden crab traps can only be deployed in waters deeper than 900 feet; in the middle and southern zones traps can only be deployed in waters deeper than 700 feet.
  Northern zone - north of the 28°N. latitude to the North Carolina/Virginia border;
  Middle zone - 28°N. latitude to 25°N. latitude; and
  Southern zone - south of 25°N. latitude to the border between the South Atlantic and Gulf of Mexico Fishery Management Councils.

Coral, Coral Reefs and Live/Hard Bottom FMP

- Established an optimum yield of zero and prohibiting all harvest or possession of these resources which serve as essential fish habitat to many managed species.
- Designated of the *Oculina* Bank Habitat Area of Particular Concern
- Expanded the *Oculina* Bank Habitat Area of Particular Concern (HAPC) to an area bounded to the west by 80°W. longitude, to the north by 28°30' N. latitude, to the south by 27°30' N. latitude, and to the east by the 100 fathom (600 feet) depth contour.
- Established the following two Satellite *Oculina* HAPCs: (1) Satellite *Oculina* HAPC #1 is bounded on the north by 28°30'N. latitude, on the south by 28°29'N. latitude, on the east by 80°W. longitude, and on the west by 80°3'W. longitude, and (2) Satellite *Oculina* HAPC #2 is bounded on the north by 28°17'N. latitude, on the south by 28°16'N. latitude, on the east by 80°W. longitude, and on the west by 80°3'W. longitude.
- Prohibited the use of all bottom tending fishing gear and fishing vessels from anchoring or using grapples in the *Oculina* Bank HAPC.
- Established a framework procedure to modify or establish Coral HAPCs.
- Established the following six deepwater CHAPCs: Cape Lookout Lophelia Banks, Cape Fear Lophelia Banks, Stetson Reefs, Savannah and East Florida Lithoherms, and Miami Terrace (Stetson-Miami Terrace), Pourtales Terrace, and Blake Ridge Diapir Methane Seep.
- Within the deepwater CHAPCs, the possession of coral species and the use of all bottom damaging gear is prohibited including bottom longline, trawl (bottom and mid-water), dredge, pot or trap, or the use of an anchor, anchor and chain, or grapple and chain by all fishing vessels.

South Atlantic Council Policies for Protection and Restoration of Essential Fish Habitat.

SAFMC Habitat and Environmental Protection Policy

In recognizing that species are dependent on the quantity and quality of their essential habitats, it is the policy of the SAFMC to protect, restore, and develop habitats upon which fisheries species depend; to increase the extent of their distribution and abundance; and to improve their productive capacity for the benefit of present and future generations. For purposes of this policy, “habitat” is defined as the physical, chemical, and biological parameters that are necessary for continued productivity of the species that is being managed. The objectives of the SAFMC policy will be accomplished through the recommendation of no net loss or significant environmental degradation of existing habitat. A long-term objective is to support and promote a net-gain of fisheries habitat through the restoration and rehabilitation of the productive capacity of habitats that have been degraded, and the creation and development of productive habitats where increased fishery production is probable. The SAFMC will pursue these goals at state, Federal, and local levels. The Council shall assume an aggressive role in the protection and enhancement of habitats important to fishery species, and shall actively enter Federal, decision- making processes where proposed actions may otherwise compromise the productivity of fishery resources of concern to the Council.

SAFMC EFH Policy Statements

In addition to implementing regulations to protect habitat from fishing related degradation, the Council in cooperation with NOAA Fisheries, actively comments on non-fishing projects or policies that may impact fish habitat. The Council adopted a habitat policy and procedure document that established a four-state Habitat Advisory Panel and adopted a comment and policy development process. Members of the Habitat Advisory Panel serve as the Council's habitat contacts and professionals in the field. With guidance from the Advisory Panel, the Council has developed and approved the following habitat policy statements which are available on the Habitat and Ecosystem section of the Council website.

Appendix F. History of Management

History of Management of the South Atlantic Snapper Grouper Fishery

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

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
FMP (1983)	08/31/83	PR: 48 FR 26843 FR: 48 FR 39463	-12" total length (TL) limit – red snapper, yellowtail snapper, red grouper, Nassau grouper. -8" TL limit – black sea bass. -4" trawl mesh size. -Gear limitations – poisons, explosives, fish traps, trawls. -Designated modified habitats or artificial reefs as Special Management Zones (SMZs).
Regulatory Amendment #1 (1987)	03/27/87	PR: 51 FR 43937 FR: 52 FR 9864	-Prohibited fishing in SMZs except with hand-held hook-and-line and spearfishing gear. -Prohibited harvest of goliath grouper in SMZs.
Amendment #1 (1988a)	01/12/89	PR: 53 FR 42985 FR: 54 FR 1720	-Prohibited trawl gear to harvest fish south of Cape Hatteras, North Carolina and north of Cape Canaveral, Florida. -Directed fishery defined as vessel with trawl gear and ≥200 lbs snapper grouper on board. -Established rebuttable assumption that vessel with s-g on board had harvested such fish in exclusive economic zone (EEZ).
Regulatory Amendment #2 (1988b)	03/30/89	PR: 53 FR 32412 FR: 54 FR 8342	-Established 2 artificial reefs off Ft. Pierce, FL as SMZs.
Notice of Control Date	09/24/90	55 FR 39039	-Anyone entering federal wreckfish fishery in the EEZ off South Atlantic states after 09/24/90 was not assured of future access if limited entry program developed.
Regulatory Amendment #3 (1989)	11/02/90	PR: 55 FR 28066 FR: 55 FR 40394	-Established artificial reef at Key Biscayne, FL as SMZ. Fish trapping, bottom longlining, spear fishing, and harvesting of Goliath grouper prohibited in SMZ.
Amendment #2 (1990)	10/30/90	PR: 55 FR 31406 FR: 55 FR 46213	-Prohibited harvest/possession of goliath grouper in or from the EEZ. -Defined overfishing for goliath grouper and other species.

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
Emergency Rule	8/3/90	55 FR 32257	-Added wreckfish to the FMU. -Fishing year beginning 4/16/90. -Commercial quota of 2 million pounds. -Commercial trip limit of 10,000 pounds per trip.
Fishery Closure Notice	8/8/90	55 FR 32635	- Fishery closed because the commercial quota of 2 million pounds was reached.
Emergency Rule Extension	11/1/90	55 FR 40181	-Extended the measures implemented via emergency rule on 8/3/90.
Amendment #3 (1990b)	01/31/91	PR: 55 FR 39023 FR: 56 FR 2443	-Added wreckfish to the FMU. -Defined optimum yield and overfishing. -Required permit to fish for, land or sell wreckfish. -Required catch and effort reports from selected, permitted vessels. -Established control date of 03/28/90. -Established a fishing year for wreckfish starting April 16. -Established a process to set annual quota, with initial quota of 2 million pounds; provisions for closure. -Established 10,000 pound trip limit. -Established a spawning season closure for wreckfish from January 15 to April 15. -Provided for annual adjustments of wreckfish management measures.
Notice of Control Date	07/30/91	56 FR 36052	-Anyone entering federal snapper grouper fishery (other than for wreckfish) in the EEZ off South Atlantic states after 07/30/91 was not assured of future access if limited entry program developed.

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

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

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

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

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

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

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
			-Implement plan to monitor and assess bycatch, -Establish reference points for golden tilefish. -Establish allocations for snowy grouper (95% com & 5% rec) and red porgy (50% com & 50% rec).
Amendment #16 (SAFMC 2009a)	7/29/09	PR: 74 FR 6297 FR: 74 FR 30964	-Specify SFA parameters for gag and vermilion snapper. - Recreational and commercial spawning closure January through April for all shallow water groupers. -For gag: Specify interim allocations 51%com & 49%rec; rec & com spawning closure January through April; directed com quota=352,940 lbs gw; -reduce 5-fish aggregate grouper bag limit, including tilefish species, to a 3-fish aggregate. - Exclude captain & crew from possessing bag limit for vermilion snapper and grouper aggregate (including tilefish species). -For vermilion snapper: The final rule specified interim allocations 68% commercial & 32% recreational; directed com quota split Jan-June equal to 315,523 lbs gw and 302,523 lbs gw July-Dec; reduce bag limit from 10 to 5 and a rec closed season November through March. -Require dehooking tools.
Amendment #17A (SAFMC 2010a)	12/3/10 red snapper closure; circle hooks March 3, 2011	PR: 75 FR 49447 FR: 75 FR 76874	- Prohibited all commercial & recreational fishing for, harvest, and possession of red snapper year-round in the South Atlantic EEZ -Required use of non-stainless steel circle hooks when fishing for snapper grouper species with hook-and-line gear north of 28 deg. N latitude in the South Atlantic EEZ. -Specify an ACL and an accountability measure (AM) for red snapper with management measures to reduce the probability that catches will exceed the stocks' ACL. -Specify a rebuilding plan for red snapper. -Specify status determination criteria for red snapper. -Specify a monitoring program for red snapper.
Emergency Rule	12/3/10	75 FR 76890	- Delay the effective date of the area closure for snapper grouper species implemented through Amendment 17A.
Amendment #17B (SAFMC 2010b)	January 31, 2011	PR: 75 FR 62488 FR: 75 FR 82280	-Specify ACLs, ACTs, and AMs, where necessary, for 9 species undergoing overfishing. -Modify management measures as needed to limit harvest to the ACL or ACT. -Update the framework procedure for specification of total allowable catch. -Prohibited harvest of six deepwater species seaward of 240 feet to curb bycatch of speckled hind and warsaw grouper. - Prohibited all harvest and possession of speckled hind and warsaw grouper by setting the ACL = 0 (landings only).
Notice of Control Date	12/4/08	74 FR 7849	Establishes a control date for the golden tilefish sector of the South Atlantic.

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
Notice of Control Date	12/4/08	74 FR 7849	- Establishes control date for black sea bass pot sector of the South Atlantic
Amendment #19 (Comprehensive Ecosystem-based Amendment 1; SAFMC 2010c)	7/22/10	PR: 75 FR 14548 FR: 75 FR 35330	-Provide presentation of spatial information for EFH and EFH-HAPC designations under the Snapper Grouper FMP. - Designation of deepwater coral HAPCs.
Regulatory Amendment #10 (SAFMC 2010c)	5/31/11	PR: 76 FR 9530 FR: 76 FR 23728	-Eliminate closed area for snapper grouper species approved in Amendment 17A.
Regulatory Amendment #9 (SAFMC 2011a)	Bag limit: 6/22/11 Trip limits: 7/15/11	PR: 76 FR 23930 FR: 76 FR 34892	- Establish trip limit for vermilion snapper and gag, increase trip limit for greater amberjack, and reduce bag limit for black sea bass.
Regulatory Amendment #11 (2011b)	5/10/12	PR: 76 FR 78879 FR: 77 FR 27374	- Eliminate 240 foot harvest prohibition for six deepwater species.
Amendment #18A (SAFMC 2012a)	July 1, 2012	PR: 77 FR 16991 FR: 77 FR 32408	- Limit participation and effort in the black sea bass portion of the snapper grouper fishery. - Modifications to management of the black sea bass pot sector. - Improve the accuracy, timing, and quantity of fisheries statistics.
Amendment 18B (TBD)	TBD	PR: 77 FR 75093	- Limit participation in the golden tilefish portion of the Snapper Grouper Fishery. - Establish initial eligibility requirements for a golden tilefish longline endorsement. - Establish an appeals process. - Allocate commercial golden tilefish quota among gear groups. - Allow for transferability of golden tilefish endorsements. - Adjust golden tilefish fishing year. - Modify trip limits for fishermen who receive a golden tilefish longline endorsement. - Establish trip limits for fishermen who do not receive a golden tilefish longline endorsement.
Amendment #20A	October 26, 2012	PR: 77 FR 19165 FR: 77 FR 59129	- Define and redistribute latent shares in the wreckfish ITQ program. - Establish a share cap. - Establish an appeals process.

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
Amendment #20B	TBD	TBD	-Update wreckfish ITQ according to Reauthorized Magnuson-Stevens Act.
Amendment #23 (Comprehensive Ecosystem-Based Amendment 2) (SAFMC 2011d)	January 30, 2012	PR: 76 FR 69230 FR: 76 FR 82183	- Designate the deepwater MPAs as EFH-HAPCs. - Limit harvest of snapper grouper species in South Carolina SMZs to the bag limit. - Modify sea turtle release gear.
Amendment #25 (Comprehensive ACL Amendment) (SAFMC 2011e)	April 16, 2012	PR: 76 FR 74757 Amended PR: 76 FR 82264 FR: 77 FR 15916	- Establish ABC control rules, ABCs, ACLs, ACTs, and AMs for species not undergoing overfishing. - Remove some species from snapper grouper FMU. - Specify ecosystem component species. - Specify allocations among the commercial and recreational sectors for species not undergoing overfishing. - Limit the total mortality for federally managed species in the South Atlantic to the ACLs.
Supplemental rule (Comprehensive ACL Amendment)	August 17, 2012	PR: 77 FR 23652 FR: 77 FR 42192	- Revise the commercial quota for greater amberjack in the regulations, from 1,169,931 lbs gw to 769,388 lbs gw.
Amendment #24 (SAFMC 2011f)	July 11, 2012	PR: 77 FR 19169 FR: 77 FR 34254	- Specify MSY, rebuilding plan (including ACLs, AMs, and OY), and allocations for red grouper.
Amendment #22	TBD	TBD	- Tagging program to allow harvest of red snapper as stock rebuilds. - Recreational tag program for golden tilefish, snowy grouper, and wreckfish.
Temporary rule for red snapper through emergency action	TBD	TBD	- Allow limited harvest of red snapper in 2012.
Resubmitted Amendment 18A Action Amendment	TBD	PR: 77 FR 55448 FR: 77 FR 72991	- Black sea bass pot endorsement transferability.

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
Regulatory Amendment 13	TBD	TBD	- Adjust ACLs and allocations for unassessed snapper grouper species with MRIP recreational estimates
Regulatory Amendment 14	TBD	TBD	- Modify the fishing year and reduce the trip limit for greater amberjack. - Implement additional regulations to protect mutton snapper during the spawning season. - Modify the minimum size limit for gray triggerfish. - Modify the commercial and recreational fishing years for black sea bass.
Regulatory Amendment 15	TBD	TBD	- Implement a revised ACL for yellowtail snapper based on the latest stock assessment, modify gag AM.
Regulatory Amendment 16	TBD	TBD	- Golden tilefish management measures.
Regulatory Amendment 17	TBD	TBD	- Adjustments to MPAs to enhance protection of speckled hind and warsaw grouper.
Regulatory Amendment 18	TBD	TBD	- ACLs and management measures for vermilion snapper and red porgy based on results of new assessment.
Amendment 27	TBD	TBD	- Establish the Council as the managing entity for Nassau grouper in the Southeast U.S. - Modify the Snapper Grouper framework. - Modify management measures for blue runner. - Reevaluate captain and crew possession prohibition for vermilion snapper, groupers, and tilefish. - Increase crew of commercial snapper grouper fishing trip.
Amendment 28	TBD	TBD	- Modify red snapper management measures, including the establishment of a process to determine future annual catch limits and fishing seasons.
Amendment 29	TBD	TBD	- Update ABCs, ACLs, and ACTs for snapper grouper species based on recommendations from SSC.

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
Amendment 30	TBD	TBD	- Vessel monitoring systems for commercial sector of snapper grouper fishery.

Appendix G. Other Applicable Laws

1.1 Administrative Procedure Act (APA)

All federal rulemaking is governed under the provisions of the APA (5 U.S.C. Subchapter II), which establishes a "notice and comment" procedure to enable public participation in the rulemaking process. Under the APA, the National Marine Fisheries Service (NMFS) is required to publish notification of proposed rules in the *Federal Register* and to solicit, consider and respond to public comment on those rules before they are finalized. The APA also establishes a 30-day wait period from the time a final rule is published until it takes effect, with some exceptions. Amendment 28 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Regulatory Amendment 28) complies with the provisions of the APA through the South Atlantic Fishery Management Council's (South Atlantic Council) extensive use of public meetings, requests for comments and consideration of comments. The proposed rule associated with this amendment will have a request for public comments which complies with the APA, and upon publication of the final rule, there will be a 30-day wait period before the regulations are effective.

1.2 Information Quality Act (IQA)

The IQA (Section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Public Law 106-443)) which took effect October 1, 2002, directed the Office of Management and Budget (OMB) to issue government-wide guidelines that "provide policy and procedural guidelines to federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information disseminated by federal agencies." OMB directed each federal agency to issue its own guidelines, establish administrative mechanisms allowing affected persons to seek and obtain correction of information that does not comply with OMB guidelines, and report periodically to OMB on the number and nature of complaints. The NOAA Section 515 Information Quality Guidelines require a series of actions for each new information product subject to the IQA. Amendment 28 has used the best available information and made a broad presentation thereof. The information contained in this document was developed using best available scientific information. Therefore, this document is in compliance with the IQA.

1.3 Coastal Zone Management Act (CZMA)

Section 307(c)(1) of the federal CZMA of 1972 requires that all federal activities that directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. While it is the goal of the South Atlantic Council to have management measures that complement those of the states, federal and state administrative procedures vary and regulatory changes are unlikely to be fully instituted at the same time. The South Atlantic Council believes this document is consistent to the maximum extent practicable with the Coastal Zone Management Plans of Florida, Georgia, South Carolina, and North Carolina. This determination will be submitted to the responsible state agencies under Section 307 of the CZMA administering approved Coastal Zone Management Programs in the States of Florida, South Carolina, Georgia, and North Carolina.

1.4 Endangered Species Act (ESA)

The ESA of 1973 (16 U.S.C. Section 1531 et seq.) requires that federal agencies must ensure actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of threatened or endangered species or the habitat designated as critical to their survival and recovery. The ESA requires NMFS to consult with the appropriate administrative agency (itself for most marine species, and the U.S. Fish and Wildlife Service for all remaining species) when proposing an action that may affect threatened or endangered species or adversely modify critical habitat. Consultations are necessary to determine the potential impacts of the proposed action. They are concluded informally when proposed actions may affect but are "not likely to adversely affect" threatened or endangered species or designated critical habitat. Formal consultations, resulting in a biological opinion, are required when proposed actions may affect and are "likely to adversely affect" threatened or endangered species or adversely modify designated critical habitat. NMFS completed a biological opinion (NMFS 2006) in 2006 evaluating the impacts of the continued authorization of the South Atlantic snapper grouper fishery under the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP) and Amendment 13C to the Snapper Grouper FMP on ESA-listed species (see **Section 3.0**). The opinion stated the fishery was not likely to adversely affect northern right whale critical habitat, seabirds, or marine mammals (see NMFS 2006 for discussion on these species). However, the opinion did state that the snapper grouper fishery would adversely affect sea turtles and smalltooth sawfish, but would not jeopardize their continued existence. An incidental take statement was issued for green, hawksbill, Kemp's ridley, leatherback, and loggerhead sea turtles, as well as smalltooth sawfish. Reasonable and prudent measures to minimize the impact of these incidental takes were specified, along with terms and conditions to implement them. See NMFS (2006) for a full discussion of impacts to smalltooth sawfish.

Sea turtles are vulnerable to capture by bottom longline and vertical hook-and-line gear. The magnitude of the interactions between sea turtles and the South Atlantic snapper grouper fishery was evaluated in NMFS (2006) using data from the Supplementary Discard Data Program (SDDP). Three loggerheads and three unidentified sea turtles were caught on vertical lines; one leatherback and one loggerhead were caught on bottom longlines, all were released alive. The effort reported in the program represented between approximately 5% and 14% of all South Atlantic snapper-grouper fishing effort. These data were extrapolated in NMFS (2006) to better estimate the number of interactions between the entire snapper-grouper fishery and ESA-listed sea turtles. The extrapolated estimate was used to project future interactions (**Table 1-1**).

The SDDP does not provide data on recreational fishing interactions with ESA-listed sea turtle species. However, anecdotal information indicates that recreational fishermen occasionally take sea turtles with hook-and-line gear. The biological opinion also used the extrapolated data from the SDDP to estimate the magnitude of recreational fishing on sea turtles (**Table 1-1**).

Regulations implemented through snapper-grouper Amendment 15B (74 FR 31225; June 30, 2009) required all commercial or charter/headboat vessels with a South Atlantic snapper grouper permit, carrying hook-and-line gear on board, to possess required literature and release gear to aid in the safe release of incidentally caught sea turtles and smalltooth sawfish. These regulations are thought to decrease the mortality associated with accidental interactions with sea turtles and smalltooth

sawfish. Subsequent to the June 7, 2006, biological opinion, elkhorn and staghorn coral (*Acropora cervicornis* and *Acropora palmata*) were listed as threatened. In a consultation memorandum dated July 9, 2007, NMFS concluded the continued authorization of the South Atlantic snapper-grouper fishery is not likely to adversely affect these *Acropora* species. On November 26, 2008, an *Acropora* critical habitat was designated. In a consultation memorandum dated December 2, 2008, NMFS concluded the continued authorization of the snapper-grouper fishery is not likely to adversely affect *Acropora* critical habitat.

Additionally, on September 22, 2011, NMFS and the U.S. Fish and Wildlife Service determined the loggerhead sea turtle population consists of nine distinct population segments (DPSs) (76 FR 58868). Previously, loggerhead sea turtles were listed as threatened species throughout their global range. The snapper-grouper fishery interacts with loggerhead sea turtles from what is now considered the Northwest Atlantic (NWA) DPS, which remains listed as threatened. Five DPSs of Atlantic sturgeon were also listed since the completion of the 2006 biological opinion. In a consultation memorandum dated February 15, 2012, NMFS concluded the continued authorization of the South Atlantic snapper-grouper fishery is not likely to adversely affect the Atlantic sturgeon. The February 15, 2012, memorandum also stated that because the 2006 biological opinion had evaluated the impacts of the fishery on the loggerhead subpopulations now wholly contained within the NWA DPS, the opinion's conclusion that the fishery is not likely to jeopardize the continued existence of loggerhead sea turtles remains valid.

Table 1-1. Three-year South Atlantic anticipated takes sea turtles by the snapper grouper fishery.

Species	**Amount of Take**	**Total**
Green	Total Take	39
	Lethal Take	14
Hawksbill	Total Take	4
	Lethal Take	3
Kemp's Ridley	Total Take	19
	Lethal Take	8
Leatherback	Total Take	25
	Lethal Take	15
Loggerhead	Total Take	202
	Lethal Take	67

Source: NMFS 2006. NMFS (National Marine Fisheries Service). 2006. Endangered Species Act Section 7 consultation on the continued authorization of snapper grouper fishing under the South Atlantic Snapper grouper Fishery Management Plan (RFFMP) and Proposed Amendment 13C. Biological Opinion. June 7.

1.5 Executive Order 12612: Federalism

E.O. 12612 requires agencies to be guided by the fundamental federalism principles when formulating and implementing policies that have federalism implications. The purpose of the Order is to guarantee the division of governmental responsibilities between the federal government and the

states, as intended by the framers of the Constitution. No federalism issues have been identified relative to the actions proposed in this document and associated regulations. Therefore, preparation of a Federalism assessment under E.O. 13132 is not necessary.

1.6 Executive Order 12866: Regulatory Planning and Review

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

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

This amendment includes the RFA as **Appendix D**.

1.7 Executive Order 12898: Environmental Justice

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

The alternatives being considered in this document are not expected to result in any disproportionate adverse human health or environmental effects to minority populations or low-income populations of Florida, North Carolina, South Carolina, or Georgia, rather the impacts would be spread across all participants in the red snapper portion of the snapper grouper fishery regardless of race or income. A detailed description of the communities impacted by the actions contained in this document and

potential socioeconomic impacts of those actions are contained in **Sections 3.0** and **4.0** of this document.

1.8 Executive Order 12962: Recreational Fisheries

E.O. 12962 requires federal agencies, in cooperation with states and tribes, to improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities through a variety of methods. Additionally, the Order establishes a seven-member National Recreational Fisheries Coordination Council responsible for, among other things, ensuring that social and economic values of healthy aquatic systems that support recreational fisheries are considered by federal agencies in the course of their actions, sharing the latest resource information and management technologies, and reducing duplicative and cost-inefficient programs among federal agencies involved in conserving or managing recreational fisheries. The National Recreational Fisheries Coordination Council also is responsible for developing, in cooperation with federal agencies, states and tribes, a Recreational Fishery Resource Conservation Plan - to include a five-year agenda. Finally, the Order requires NMFS and the U.S. Fish and Wildlife Service to develop a joint agency policy for administering the ESA.

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

1.9 Executive Order 13089: Coral Reef Protection

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

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

1.10 Executive Order 13158: Marine Protected Areas

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

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

1.11 Marine Mammal Protection Act (MMPA)

The MMPA established a moratorium, with certain exceptions, on the taking of marine mammals in U.S. waters and by U.S. citizens on the high seas. It also prohibits the importing of marine mammals and marine mammal products into the United States. Under the MMPA, the Secretary of Commerce (authority delegated to NMFS) is responsible for the conservation and management of cetaceans and pinnipeds (other than walruses). The Secretary of the Interior is responsible for walruses, sea otters, polar bears, manatees, and dugongs. Part of the responsibility that NMFS has under the MMPA involves monitoring populations of marine mammals to make sure that they stay at optimum levels. If a population falls below its optimum level, it is designated as "depleted". A conservation plan is then developed to guide research and management actions to restore the population to healthy levels.

In 1994, Congress amended the MMPA, to govern the taking of marine mammals incidental to commercial fishing operations. This amendment required the preparation of stock assessments for all marine mammal stocks in waters under U.S. jurisdiction; development and implementation of take-reduction plans for stocks that may be reduced or are being maintained below their optimum sustainable population levels due to interactions with commercial fisheries; and studies of pinniped-fishery interactions. The MMPA requires a commercial fishery to be placed in one of three categories, based on the relative frequency of incidental serious injuries and mortalities of marine mammals. Category I designates fisheries with frequent serious injuries and mortalities incidental to commercial fishing; Category II designates fisheries with occasional serious injuries and mortalities; and Category III designates fisheries with a remote likelihood or no known serious injuries or mortalities.

Under the MMPA, to legally fish in a Category I and/or II fishery, a fisherman must take certain steps. For example, owners of vessels or gear engaging in a Category I or II fishery, are required to obtain a marine mammal authorization by registering with the Marine Mammal Authorization Program (50 CFR 229.4). They are also required to accommodate an observer if requested (50 CFR 229.7(c)) and they must comply with any applicable take reduction plans. The commercial hook-and-line components of the South Atlantic snapper grouper fishery (i.e., bottom longline, bandit gear, and handline), which targets red snapper are listed as part of a Category III fishery (76 FR 37716, June 28, 2011) because there have been no documented interactions between these gear and marine mammals. The black sea bass pot component of the South Atlantic snapper grouper fishery is part of the Atlantic mixed species trap/pot fishery, a Category II fishery, in the 2012 proposed LOF (76 FR 37716, June 28, 2011). The Atlantic mixed species trap/pot fishery designation was created in 2003 (68 FR 41725, July 15, 2003), by combining several separately listed trap/pot fisheries into a single group. This group was designated Category II as a precaution because of known interactions between marine mammals and gears similar to those included in this group. Prior to this consolidation, the black sea bass pot fishery in the South Atlantic was a part of the "U.S. Mid-Atlantic and Southeast U.S. Atlantic Black Sea Bass Trap/Pot" fishery (Category III). There has never been a documented interaction between marine mammals and black sea bass trap/pot gear in the South Atlantic. The actions in this EA are not expected to negatively impact the provisions of the MMPA

1.12 National Environmental Policy Act (NEPA)

This document has been written and organized in a manner that meets NEPA requirements, and thus is a consolidated NEPA document, including an EA, as described in NOAA Administrative Order (NAO) 216- 6, Section 6.03.a.2.

Purpose and Need for Action

The purpose and need for this action are described in **Section 1.0.**

Alternatives

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

Affected Environment

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

Impacts of the Alternatives

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

1.13 National Marine Sanctuaries Act (NMSA)

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

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

1.14 Paperwork Reduction Act (PRA)

The purpose of the PRA is to minimize the burden on the public. The PRA is intended to ensure that the information collected under the proposed action is needed and is collected in an efficient manner (44 U.S.C. 3501 (1)). The authority to manage information collection and record keeping requirements is vested with the Director of the Office of Management and Budget (OMB). This

authority encompasses establishment of guidelines and policies, approval of information collection requests, and reduction of paperwork burdens and duplications. The PRA requires NMFS to obtain approval from the OMB before requesting most types of fishery information from the public. Actions in this document are not expected to affect PRA.

1.15 Regulatory Flexibility Act (RFA)

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

As NMFS has determined whether a proposed fishery regulation would have a significant economic impact on a substantial number of small entities, a certification to this effect will be prepared and submitted to the Chief Counsel for Advocacy of the Small Business Administration.

1.16 Small Business Act (SBA)

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

1.17 Public Law 99-659: Vessel Safety

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

No vessel would be forced to participate in South Atlantic fisheries under adverse weather or ocean conditions as a result of the imposition of management regulations proposed in this amendment. No concerns have been raised by South Atlantic fishermen or by the U.S. Coast Guard that the proposed management measures directly or indirectly pose a hazard to crew or vessel safety under adverse weather or ocean conditions.

Appendix H. Fishery Impact Statement

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) requires a Fishery Impact Statement (FIS) be prepared for all amendments to Fishery Management Plans (FMPs). The FIS contains an assessment of the likely biological and socioeconomic effects of the conservation and management measures on: 1) fishery participants and their communities; 2) participants in the fisheries conducted in adjacent areas under the authority of another Council; and 3) the safety of human life at sea.

Actions Contained in Amendment 28 to the Fishery Management Plan for the Snapper-Grouper Fishery of the South Atlantic Region (Amendment 28)

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, the South Atlantic Fishery Management Council (South Atlantic Council) and National Marine Fisheries Service (NMFS) prohibited the harvest and possession of red snapper in or from the South Atlantic exclusive economic zone. In 2012, a limited red snapper fishing season was established through an emergency action under the Magnuson-Stevens Act. The 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.

Similarly, the South Atlantic Council has determined that retention of a limited number of red snapper, beginning in 2013, would not jeopardize the rebuilding of the red snapper stock if the acceptable biological catch (ABC) is not exceeded the previous year. As such, the South Atlantic Council has outlined a process in Amendment 28 where NMFS would determine the magnitude of red snapper harvest that would be allowed each year. If harvest is allowed (when last year's mortality level is less than last year's ABC), NMFS would announce the annual catch limit (ACL) as computed by the equation outlined in Amendment 28. The South Atlantic Council has chosen start dates for the commercial and recreational seasons in the amendment as the 2nd Monday and 2nd Friday in July, respectively. NMFS would also announce the end dates of the recreational season; the commercial season would be closed when the ACL is projected to be met. In Amendment 28, the South Atlantic Council also has specified the following preferred alternatives: (1) a commercial trip limit of 75 pounds gutted weight; (2) a recreational bag limit of one per person per day; and (3) removal of the size limit.

Assessment of Biological Effects

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 Southeast, Data, Assessment, and Review (SEDAR) 24; (2) rebuilding projections provided by the Southeast Fisheries Science Center (SEFSC); (3) ABC recommendation from the South Atlantic Council's Scientific and Statistical Committee (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 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.

"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 bag limit could decrease the incentive to target red snapper; targeting of red snapper may increase discards if high-grading occurs as described previously.

Assessment of Economic Effects

Since this action only establishes a methodological approach for estimating potential ACLs and the resulting season lengths in 2013 and future years, quantitative estimates of ACLs and season lengths for the commercial and recreational sectors are not currently available for 2013 and future years. In turn, quantitative estimates of potential changes in landings and gross revenue for the commercial sector as well target trips and net operating revenue for the for-hire sector in 2013 and future years cannot be provided at this time. However, this action creates a positive probability that a fishing season will occur in 2013 and future years, whereas that probability is zero if the South Atlantic Council takes no action. Thus, the economic effects of this action are expected to be positive, particularly in the short-term. Long-term economic effects are also expected to be positive, as the probability of a fishing season would still be positive, but are dependent on information arising from future stock assessments and the effect of such information on estimates of ABC in future years.

If the commercial ACL is sufficiently large to allow a commercial fishing season, gross revenue from the commercial harvest of red snapper would be positive and thus so too would be the economic benefits. Since the commercial ACL is expected to be relatively small in the short-term, these benefits are also expected to be relatively small. These benefits are expected to be slightly enhanced by the commercial season start date of the second Monday in July and elimination of the minimum size limit, but slightly reduced by the 75 pound gutted weight trip limit. Similarly, if the recreational ACL is sufficiently large to allow a recreational fishing season, consumer surplus from recreational fishing trips is expected to be greater than if the South Atlantic Council took no action and net operating revenue (NOR) from trips targeting red snapper by for-hire vessels may be positive rather than zero under this action. However, relative to commercial vessels, this outcome is less likely for for-hire vessels as the recreational ACL and the for-hire sector's share of the harvest would have to be sufficiently great to increase their red snapper target effort. Since the recreational ACL is expected to be relatively small in the short-term and the for-hire sector has historically only accounted for 10% of

red snapper target effort, any increase in for-hire vessels' target effort is likely to be minimal at best in the short-term. The recreational fishing season start date of the second Friday in July, the one-fish bag limit, and elimination of the minimum size limit are expected to slightly enhance these economic benefits.

Assessment of the 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 (AM) 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 AM 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.

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 South Atlantic 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.

Assessment of the 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. A limited fishing season occurred in 2012; however, under the no action alternative, there would not be a red snapper opening beginning 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 trip limit of varying weights during the fishing seasons. Establishing an ACL would result in increased enforcement needs and outreach. Regardless of which sub-alternatives are selected, the administrative impacts would be similar.

Alternative 7 (Preferred) would specify a 1 fish bag limit and would increase the administrative impacts relative to a total harvest prohibition of red snapper (**Alternative 1 No Action**).

Assessment of Effects on Safety at Sea

The implementation of the proposed action would not be expected to affect the current level of safety at sea. A derby fishery that can contribute to safety at sea concerns is unlikely. Due to the small trip limit commercial fishermen would likely not target red snapper and only retain incidentally caught fish. Establishment of a one fish bag limit with **Alternative 7 (Preferred)** for the recreational sector is expected prevent a derby fishery from developing.